POLICY DEVELOPMENT & RESEARCH BRANCH

RESEARCH REPORT:

Metropolitan Toronto Exceptional Load Route Designations

TRANSPORTATION DEPARTMENT

THE MUNICIPALITY OF METROPOLITAN TORONTO

ACKNOWLEDGEMENTS

The members of the Project Team would like to thank the following for their assistance and participation in this project:

- The Commissioners of Public Works for the Area and Regional Municipalities;
- Representatives of the Public Works Offices and Permits Sections for the Area and Regional Municipalities;
- Representatives from the Ministry of Transportation Ontario;
- Members of the Heavy Specialized Carriers Division of the Ontario Trucking Association;
- Representatives from the Toronto Harbour Commission;
- Employees of the Metropolitan Toronto Transportation Department, and;
- the many employees of municipal departments, public agencies and private enterprises who contributed to this study.

UMA Engineering Ltd.
5080 Commerce Blvd.
Mississauga, Ontario
L4W 4P26

LIST OF EXHIBITS

EXHIBIT	TITLE	FOLLOWING PAGE
1.1	Project Study Area	3
1.2	Roads Under Metropolitan Toronto Jurisdiction	3
2.1	Main Exceptional Load Routes to/from the Port of Toronto	10
2.2	Main Exceptional Load Routes to/from Bermondsey Drive Industrial Area	11
2.3	Main Exceptional Load Routes to/from Trethewey Drive Industrial Area	11
2.4	Moderate Exceptional Load Traffic Areas	11
2.5	Major Exceptional Load Corridors: Metro Roads	12
2.6	Minor Exceptional Load Corridors: Metro Roads	14
2.7	Combined Major/Minor Exceptional Load Corridors: Metro Roads	14
2.8	Provincial Corridors	15
2.9	Regional Provincial Roadway	15
3.1	Distribution of Exceptional Dimensions	17
3.2	Cumulative Frequencies of Exceptional Load Dimensions	18
4.1a	Volumes of Exceptional Width Vehicles	24
4.1b	Metro Roads Used by Exceptional Load Vehicles	24
4.2a	Kipling Avenue and Warden Avenue Underpasses	25
4.2b	St. Clair Avenue and Bathurst Street Underpasses	25
4.3	Locations of Other Width Obstacles	25
4.4a	Volumes of Exceptional Height Vehicles	25
4.4b	Metro Roads Used by Exceptional Height Vehicles	25
4.5	Locations of Other Height Obstacles	27
4.6a	Volumes of Exceptional Length Vehicles	27
4.6b	Metro Roads Used by Exceptional Length Vehicles	27

5.1	Metro Roads Common Among Four Dimensions	31
5.2	Metro Roads Common Among Three or More Dimensions	31
5.3	Proposed Current Route Designation for the Secondary Exceptional Load Envelope	33
5.4	Area Municipal Roads Within the Metro Context	35
5.5	Phase 2 Route Modifications	38
5.6	Proposed Interim Route Designation For the Secondary Exceptional Load Envelope, Phase 2	40
5.7	Phase 3 Route Modifications	41
5.8	Proposed Final Route Designation For The Primary Exceptional Load Envelope, Phase 3	42

EXECUTIVE SUMMARY

BACKGROUND

An exceptional load vehicle is defined as one whose height, width, length and/or weight is greater than regulated by the Highway Traffic Act or municipal by-law for unrestricted movement on public roadways. Typical exceptional load trips include the redistribution of portable classrooms, replacement of telephone poles, movement of boats, delivery of new streetcars and specialized machines, structures and equipment.

This study confirms that "corridors for exceptional loads are restricted throughout (Metropolitan Toronto) due to structure clearances and load restrictions, above and below ground utilities, and in many cases the TTC streetcar wires."[1] Because of ongoing developments to Metropolitan Toronto's infrastructure, the "potential for further restriction exists."[2]

This study, recommended by the Metropolitan Toronto Goods Movement Study, addresses the concern of decreasing route opportunities by proposing a set of roads to be designated as exceptional load (E.L.) routes, and a set of dimensions to comprise the E.L. envelope. The goals of this study are the immediate protection of the current E.L. routes and the eventual preservation of a complete E.L. network. The following activities were undertaken during the study:

- the determination of Provincial, Metro and Area Municipal roads used by exceptional load vehicles;
- the establishment of the exceptional load dimensions that encompass the majority of exceptional loads in the form of exceptional load envelopes;
- the establishment of an interim exceptional load network currently capable of accommodating the chosen dimensions; and
- the determination of a long term exceptional load network.

FINDINGS

Metropolitan Toronto E.L. trip specific permits issued during the period from January, 1988 to September, 1989 were analyzed. This analysis revealed where the majority of E.L. activity was concentrated:

	% of Metro E.L. Trips
Port of Toronto	40
Bermondsey Road Industrial Area	15
Tretheway Drive Industrial Area	15
Mimico/Long Branch	5
Lower Toronto CBD	5
Midwest Scarborough	5
North Scarborough	5

1. Metropolitan Toronto Goods Movement Study, Metropolitan Toronto Roads and Traffic Dept., Dec. 1987
2. Ibid.

Major Corridors of E.L. traffic service the above seven areas as shown in Exhibit A. Minor Corridors to compliment the major corridors as feeders and are also shown in Exhibit A.

The study found that certain problems currently exist with regard to exceptional load movement in Metro Toronto.

- the most troublesome obstacles are the rail overpasses at:

  Kipling Avenue, north of Horner Avenue
  Warden Avenue, south of Danforth Avenue
  Bathurst Street, north of Dupont Street
  St. Clair Avenue, west of Caledonia Road

- overhead utility and transit lines, crossover signs and traffic signal heads are too numerous and their heights too variable to inventory and continuously update. While the obstacles do not present insurmountable problems to exceptional load traffic, electrical service escorts will be required until the obstacles are routinely placed well above five metres in height.

- other obstacles, while obstructing one or more of the four dimensions, cause many E.L. routes to be overly circuitous and difficult to negotiate. These include: streetcar pedestrian islands, roadway underpasses and street side utility facilities.

ROUTE AND ENVELOPE DESIGNATIONS

Completion of a Metro-wide network of exceptional load roads capable of accommodating the majority of traffic cannot be attained at once. The modifications necessary will only be achieved given time.

As a compromise between designating an E.L. Route in a timely fashion and the completion of a final network, two sets of E.L. dimensions (envelopes) are proposed. The Primary E.L. Envelope will eventually accommodate the majority of exceptional loads on the Final Route, whereas the Secondary E.L. Envelope, one with a set of lesser dimensions, allows for an interim designation until the Final Route system is complete.

Discussions with industry and municipal groups, plus analysis of the existing road network and issued permits led to the recommendation for the dimensions of the Primary and Secondary E.L. envelopes. Both envelopes, in relation to the Metropolitan Toronto Limits, are shown in Exhibit B.

It is therefore recommended that an implementation scheme of three phases be adopted to fulfill the objectives of the study:

Phase 1: Proposed Current Route Designation
These are the Metro roads currently capable of accommodating loads up to the dimensions of the Secondary E.L. Envelope.

Phase 2: Proposed Interim Route Designation
All of the Metro roads comprising the Final Route Network but only capable of accommodating the Secondary E.L. Envelope. This phase requires all secondary roadway modifications.

Phase 3: Proposed Final Route Designation
The complete set of Metro roads capable of accommodating loads up to the dimensions of the Primary E.L. Envelope. This phase requires all primary roadway modifications.

EXHIBIT A: MAJOR EXCEPTIONAL LOAD CORRIDORS, METRO ROADS

MINOR EXCEPTIONAL LOAD CORRIDORS, METRO ROADS

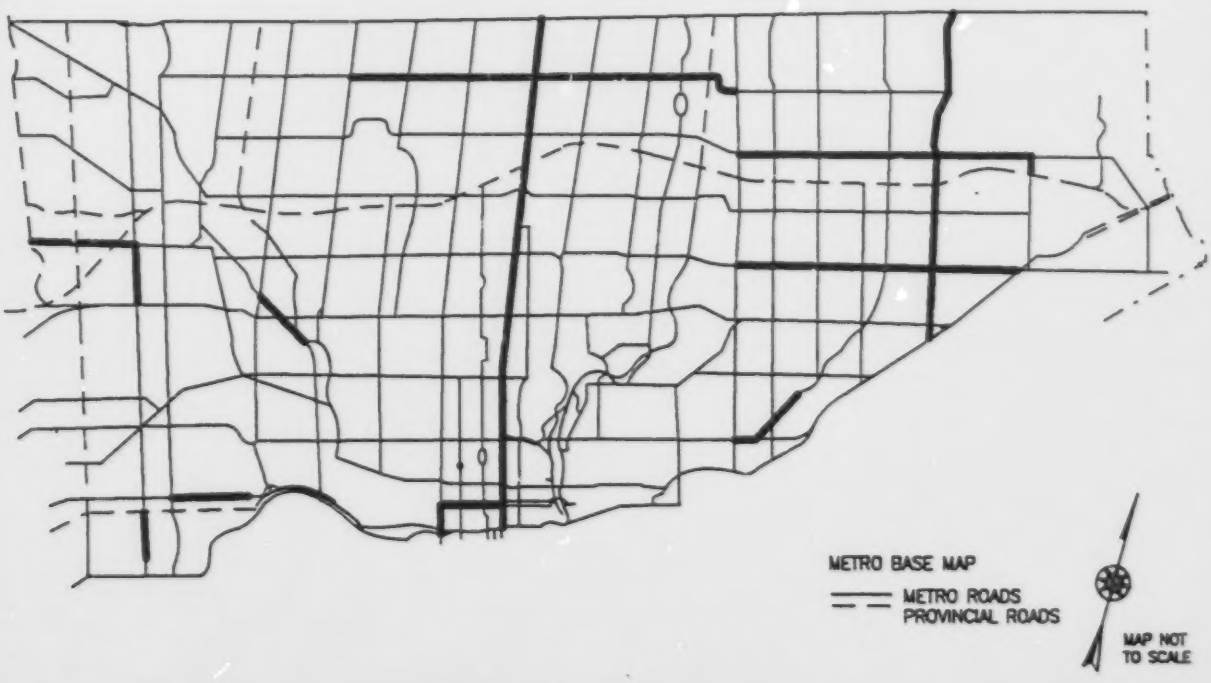
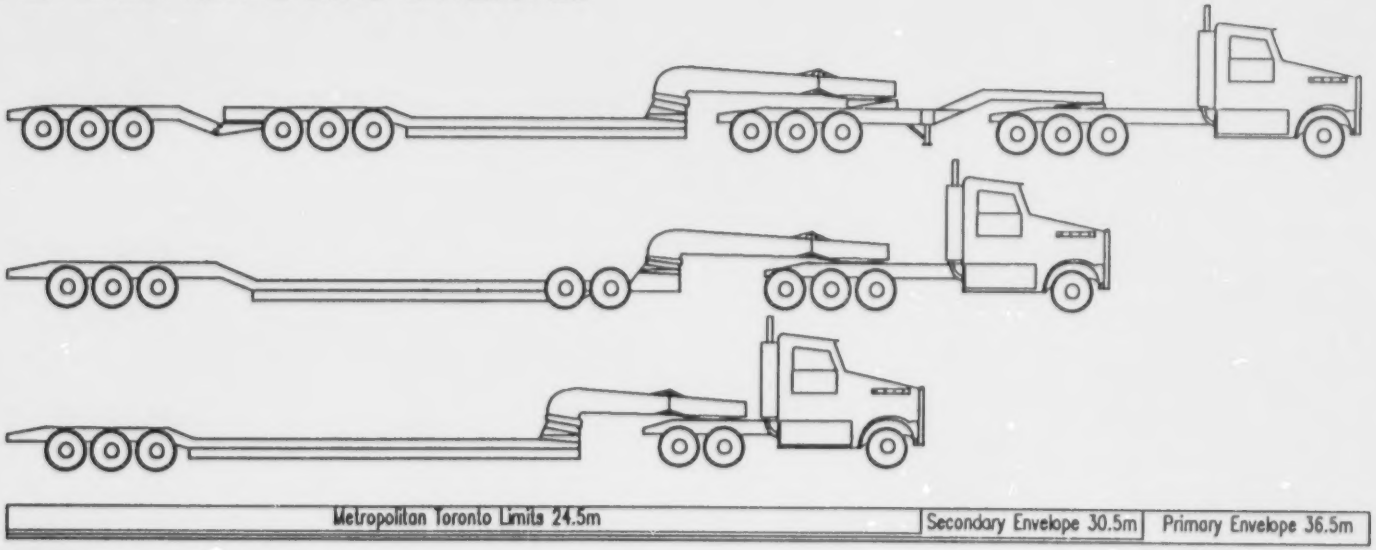
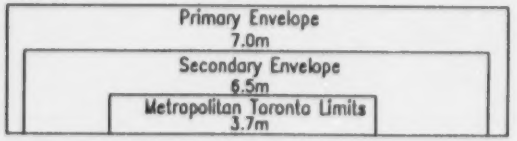


EXHIBIT B: EXCEPTIONAL LOAD ENVELOPES

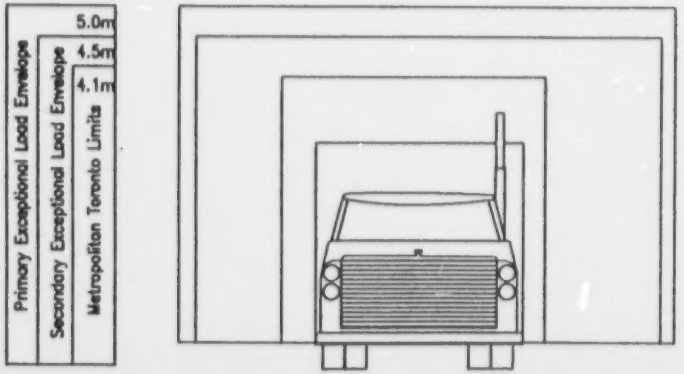


LENGTH

WIDTH



HEIGHT



PHASE 1: Current Route Designation

- necessary for the preservation of the existing routes and preventing further route closures.

Designate **Current Exceptional Load Route** (Exhibit C)

- commence comprehensive load study on all bridges, roads and other structures on the recommended Final Route Designation
- commence secondary roadway modifications and appropriate primary roadway modifications for Interim Route Network (Table 1)
- initiate discussions with Etobicoke, Scarborough and Toronto for temporary designation of integral Area Municipal roads (Exhibit D)
- initiate discussions with the Province of Ontario/MTO on modification to Provincial structures integral to the Metrtopolitan Toronto network (Exhibit D)
- upon completion of secondary roadway modifications, designate Secondary Exceptional Load Envelope (Exhibit B)

PHASE 2: Interim Route Network

- a suitable compromise between roads that are currently available and those desired for use in the future.

Designate **Interim Exceptional Load Route** (Exhibit E)

- complete remaining primary roadway modifications for final network (Table 1)
- upon completion of primary modifications, designate Primary Exceptional Load Envelope (Exhibit B)

PHASE 3: Final Route Network

- The final system of Metro Roads made capable of accommodating exceptional load vehicles and preserved for continuing usage.

Designate **Final Exceptional Load Route** (Exhibit F)

TABLE 1 : MODIFICATIONS NECESSARY TO COMPLETE INTERIM AND FINAL NETWORKS

LOCATION – DESCRIPTION	MODIFICATION TYPE	SECONDARY (m)	PRIMARY (m)
Steeles Ave under Hwy 401	height clearance	+0.05	+0.45
Steeles Ave under CNR east of Keele St.	height clearance	+0.04	+0.44
Wilson Rd. under Hwy 401	height clearance	+0.38	+0.78
Yonge St. under Hwy 401, northbound	height clearance	+0.20	+0.60
southbound	height clearance	+0.10	+0.50
Warden Ave. under CPR, south of Danforth Ave	height clearance	+0.20	+0.60
	width clearance	+3.60	+7.20
	grade leveling	*	*
Alternate to Warden Ave. Kennedy Rd, from Danforth Rd. to Kingston Rd.	road completion		*
	road widening		*
Alternate to Warden Ave. Victoria Park Ave. south of Danforth Ave.	height clearance	+.060	+1.00
	road widening		*
Alternate to Warden Ave. Birchmount Rd. south of Danforth Ave.	designate Metro road	*	*
Jane St. under Hwy 400	height clearance	+0.13	+0.53
Eglinton Ave. under CPR, east of Weston Rd.	height clearance, westbound	+0.13	+0.53
	height clearance, eastbound		+0.33
Yore Rd., full length	road widening	*to* 6.50	*to* 7.00
Alternate to Yore Rd. Use of existing route: Keele St./Eglinton Ave./Keele St.	none		

TABLE 1: MODIFICATIONS NECESSARY TO COMPLETE INTERIM AND FINAL NETWORKS (continued)

LOCATION – DESCRIPTION	MODIFICATION TYPE	SECONDARY (m)	PRIMARY (m)
Eglinton Ave. under CPR, east of Leslie St.	height clearance	+0.15	+0.55
Kipling Ave. under Bloor St./Dundas St.	height clearance	+0.40	+0.80
Lakeshore Blvd. under QEW, westbound	height clearance	+0.28	+0.68
Markham Rd. under Hwy 401	height clearance	+0.10	+0.50
St. Clair Ave. under CPR, west of Caledonia Rd.	height clearance	+0.60	+1.00
PHASE 3 MODIFICATIONS ONLY:			
Kipling Ave., south of Horner Ave.	reconstruct underpass		*
Bathurst St., north of Davenport Rd.	reconstruct underpass		*
Steeles Ave. under CPR, west of Leslie St.	height clearance		+0.24
Lakeshore Blvd. westbound to east end of Gardner Expressway	widen ramp		*to* 7.2
Kingston Rd. westbound under Danforth Rd.	height clearance		+0.27
Bathurst St. under Hwy 401			
eastbound	height clearance		+0.20
westbound	height clearance		+0.30
Eglinton Ave. under the Don Valley Parkway	height clearance		+0.12
Lakeshore Blvd, under pedestrian Bridge, west of Jameson Ave.	height clearance		+0.20

EXHIBIT D: INTEGRAL AREA MUNICIPAL ROADS AND PROVINCIAL STRUCTURES

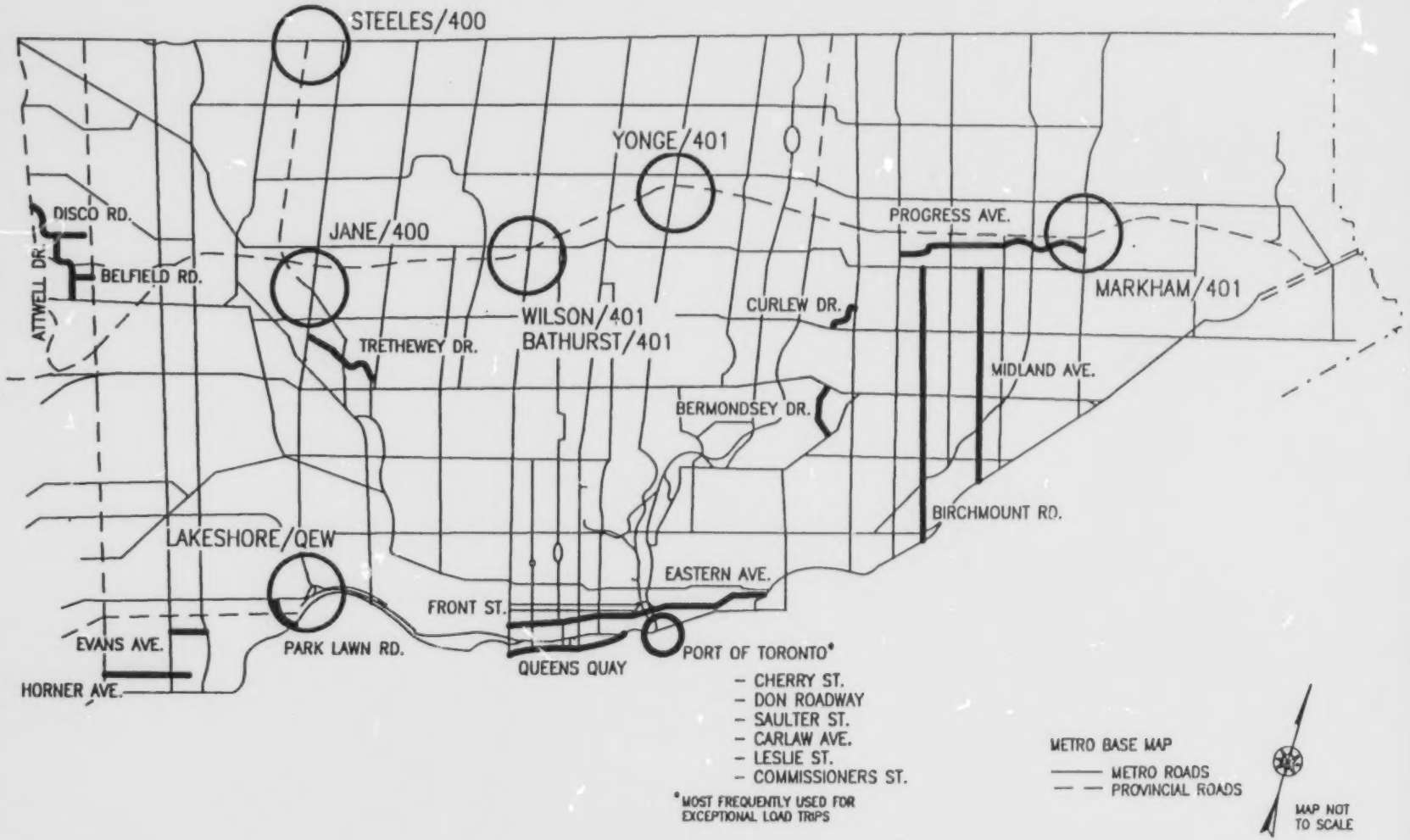


EXHIBIT E: PROPOSED INTERIM ROUTE DESIGNATION FOR THE SECONDARY EXCEPTIONAL LOAD ENVELOPE, PHASE 2

ALTHOUGH THESE MODIFICATIONS ARE NECESSARY TO COMPLETE THE SECONDARY NETWORK, THE SCALE OF MODIFICATION MAY CAUSE THE WORK TO BE HELD OFF FOR THE PRIMARY NETWORK
METRO BASE MAP
METRO ROADS
PROVINCIAL ROADS
7
PROVINCIAL HIGHWAY NUMBER
MAP NOT TO SCALE

EXHIBIT F: PROPOSED FINAL NETWORK FOR THE PRIMARY EXCEPTIONAL LOAD NETWORK, PHASE 3

B – Route selection to be dependant upon Metro Government priorities.

A – To be reassessed after reconsruction of the Kipling Ave. underpass, south of Horner Ave.

METRO BASE MAP

METRO ROADS

PROVINCIAL ROADS

⑦ PROVINCIAL HIGHWAY NUMBER

MAP NOT TO SCALE

RELATED ISSUES

Certain issues arose during the course of the study which lay outside the original mandate. Because of their relevance to the subject and their prevalence in the investigations, recommendations were made in their regard.

Permit Process

- Metro Toronto act upon recommendation #12 of the Metropolitan Toronto Goods Movements Study to "... *develop measures to improve the permit approval process*" (Sec. 6.2.1).

- Metro Toronto create a temporary "Project Permit" for use during large construction projects. Among the characteristics of this permit are: an initial route study, inclusion of Metro and Area Municipal roads, and an expedient approval process for individual project trips (Sec. 6.2.2.).

Port of Toronto

- Metro Toronto consider a joint project with the City of Toronto and the Toronto Harbour Commission to maintain and improve port roads that are integral to exceptional load traffic (Sec. 6.3.1).

Trans-Border Movements

- Metro Toronto request the Province of Ontario to allow exceptional load trips during the hours of 12:00 a.m. - 6:00 a.m. on suitably lit provincial roadways and to extend continuous lighting on provincial expressways to suitable lay-by areas or weigh stations (Sec. 6.3.3).

Awareness

- Metro Toronto initiate an Exceptional Load Issues Committee made up of interested bodies to address the ongoing issues of this subject. This group to meet 2 to 6 times yearly, as necessary (Sec. 6.4.1).

Exceptional Load Activity Trends

- Metro Toronto develop a computerized database system to allow for the ongoing study, analysis and reporting of the exceptional load environment (Sec. 6.4.2).

Inventories

- Metro Toronto develop update and make available an extensive inventory of all utilities and structures with reference to the Primary Exceptional Load Envelope (Sec. 6.4.3).

Future Projects

- All future road creation and improvement projects be reviewed upon their initiation as to their potential effects on the proposed Primary Envelope and Route Designation (Sec. 6.4.4).

1.0 INTRODUCTION

1.1 BACKGROUND

Authorized in June, 1986 and completed by March, 1988, the Metropolitan Toronto Goods Movement Study was undertaken by consultants for the Metropolitan Toronto Transportation Department.[1] This study involved various aspects of goods movement by truck throughout the Metropolitan Toronto Region. The five major components of the study were:

- the relationship between the economics of goods movement and that of Metropolitan Toronto in general;
- truck routes and restrictions;
- goods pick-up and delivery;
- shipment of dangerous commodities, and;
- exceptional load movements.

The Goods Movement Study established a set of twelve recommendations regarding these topics. Recommendations #11 and #11b of the study concern exceptional load movements and are reproduced below.

Recommendation #11

"It is recommended that Metropolitan Toronto, in consultation with the Area Municipalities, the utility companies, and the trucking industry, establish and protect a system of exceptional load routes with design standards which will accommodate the majority of exceptional loads, in terms of dimensions, weight and route, without the need for detailed route review but retaining the right of approval for municipal agencies and utility companies."

Recommendation #11b

"consult with the Area Municipalities with the objective of designating exceptional load routes on local streets as necessary to provide access to major generators of exceptional loads;"

---

1 Formerly known as the Metropolitan Toronto Roads and Traffic Department

1.2 STUDY GOALS

UMA Engineering Ltd. was retained by the Transportation Department of the Municipality of Metropolitan Toronto to carry out the study as described above, in recommendations #11 and #11b.

The project involved four key elements:

- the determination of the Provincial, Metropolitan Toronto and Area Municipal roadways that are used by exceptional load vehicles;
- the establishment of an envelope of exceptional load dimensions, which encompasses the majority of exceptional loads;
- the establishment of an interim network of Metropolitan Toronto roads presently capable of accommodating exceptional load vehicles within the defined envelope, and;
- the determination of a long term network of roads, to be designated and preserved, as exceptional load routes based upon additions, modifications and improvements to the interim network.

Of utmost concern in this study is the preservation of existing routes used by carriers. Roadway and bridge construction and improvements have systematically reduced the routing possibilities for exceptional load movements. Increased traffic congestion and changes in land use have reduced the efficiency of the exceptional load trips. More often, carriers have had to develop elaborate routing plans to move these loads. Before the most preferred exceptional load corridors are closed off to this traffic, Metropolitan Toronto must preserve them by ensuring against development into the exceptional load envelope.

Further, since such development has generally proceeded without reference to exceptional load traffic on existing roads, many 'best route' alternatives may no longer be available. Railway underpasses, suburban boulevards and pedestrian walkways may necessitate the use of detours from Metropolitan Toronto roads to Area Municipal roads and cause extensive restructuring of the preferred routing system. In the long term, such diversions would ideally be corrected to increase the

efficiency of exceptional load traffic by minimizing time and mileage, and thus reducing costs to carriers and consumers.

Finally, while no specific monetary costs or benefits have been assigned to the exceptional load movement industry in Metropolitan Toronto, it is clear that Metropolitan Toronto would suffer a net economic loss should this activity disappear or be further impinged by network restrictions. Some heavy industries firmly established within Metropolitan Toronto would be forced to relocate, a significant portion of harbour activity would be lost, and Metropolitan Toronto's goods movement industry would suffer a loss of reputation and business.

Clearly, an exceptional load designation is not only a benefit to existing carriers but also a necessity for heavy industry to survive in the Metropolitan Toronto Region over the long term. Indeed, an approved and preserved route designation in Metropolitan Toronto may even encourage industry's presence in the area. It would also be of special benefit to the Port of Toronto, which is a major focal point for exceptional load activity in the Metropolitan area.

1.3 STUDY AREA

In looking at the environment of exceptional load activity, this project's study area encompassed all of Metropolitan Toronto and the cross-boundary region with the surrounding Municipalities. This includes Mississauga and Brampton in Peel Region, Vaughan, Richmond Hill and Markham in York Region, and Pickering in Durham Region as shown in Exhibit 1.1.

The actual roads to be designated in this study are those under the jurisdiction of Metropolitan Toronto, i.e. "Metropolitan Toronto roads", as they are defined and named in the Official Plan. These roads are presented in Exhibit 1.2.

Although only Metropolitan Toronto roads are to be designated, connections to Provincial highways, neighbouring Regional roads and Area Municipal roads within this study area were investigated to determine the relationship of exceptional load traffic among the municipalities of the Greater Toronto Area.

EXHIBIT 1.1: PROJECT STUDY AREA

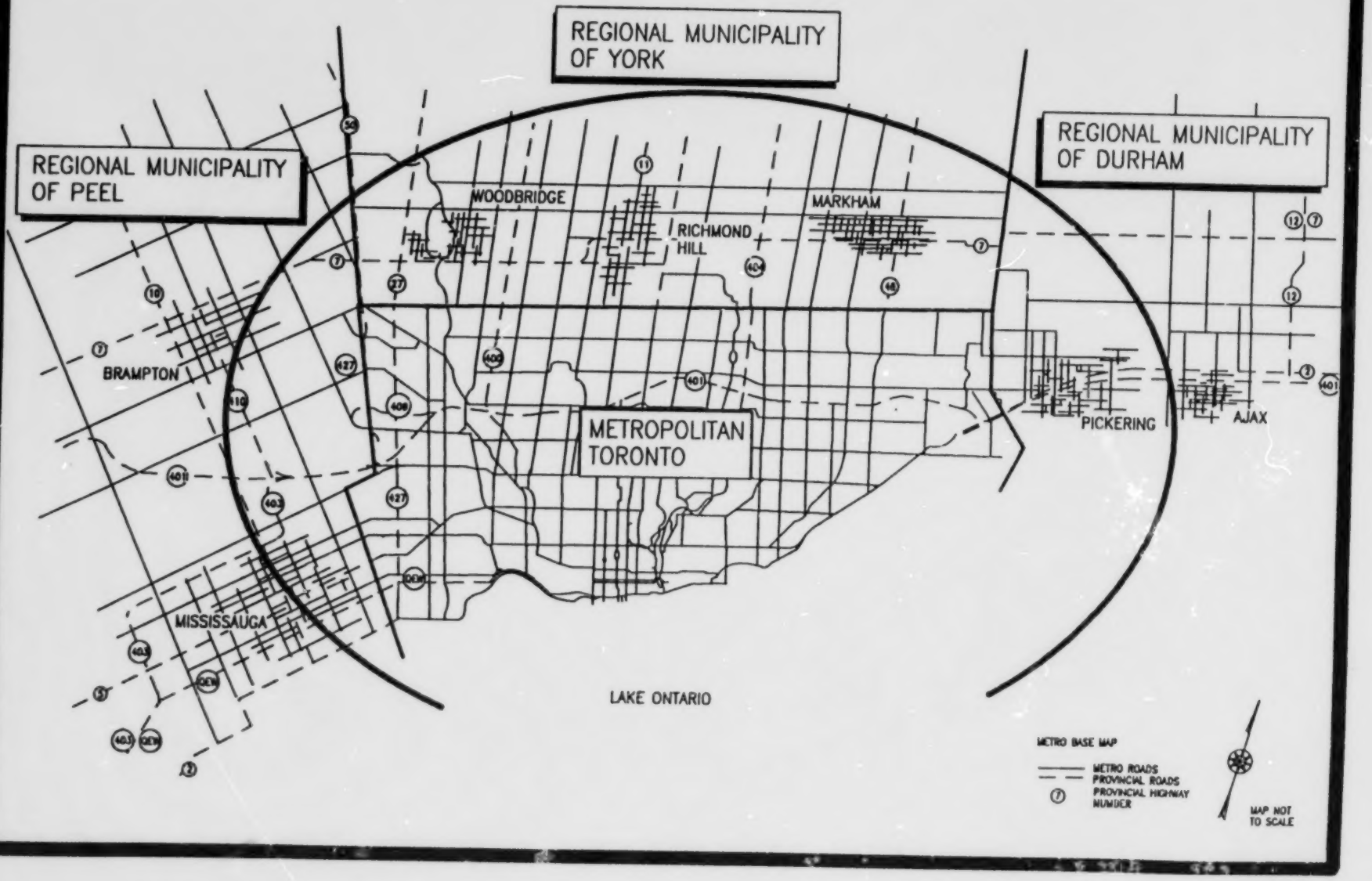


EXHIBIT 1.2: ROADS UNDER METROPOLITAN TORONTO JURISDICTION 'METRO ROADS'*

* MOST MAJOR METRO ROADS ARE NAMED HERE. OTHERS ARE REFERRED TO LATER IN THE TEXT

1.4 METHODOLOGY

In order to satisfy the study goals as stated in Section 1.2, four main methods of data collection and interpretation were used:

- Public and Private Sector Consultations,
- Exceptional Load Permit Analysis,
- Document and Road Data Review, and,
- Field Investigations of Provincial, Metropolitan Toronto and Area Municipal Roads.

The first method involved a series of meetings with Provincial, Metropolitan Toronto, Area Municipal and Industry representatives. This was undertaken primarily to obtain the perspectives of the many groups involved in exceptional load activity and what issues are important to them. As well, input and information was received from these groups regarding activity levels within their jurisdictions, road types and known obstructions, preferred routes and ideal exceptional load envelope dimensions. The list of groups that were consulted for the project is as follows:

Area Municipalities:

- The Borough of East York,
- The City of Etobicoke,
- The City of North York,
- The City of Scarborough,
- The City of Toronto,
- The City of York.

Bordering Regions:

- The Regional Municipality of Durham
- The Regional Municipality of Peel
- The Regional Municipality of York

Expert Groups:

- The Ministry of Transportation (Ontario)
- The Ontario Trucking Association,
- The Toronto Harbour Commission

The second method of data collection was an extensive analysis of the Metropolitan Toronto and Area Municipal exceptional load permits during the period of January, 1988 and September, 1989. There were two major components to this analysis: exceptional load dimensions and currently used routes. The former involved statistical tests and distribution for each exceptional dimension and the latter mapped out frequent and infrequent routes involving Metropolitan Toronto and Area Municipal roads as well as the entry and exits points at Provincial highways and Regional boundaries.

Third, many documents were requested and received relevant to issues in exceptional load activity and specific roadway infrastructure dimensions. Most groups involved in the meeting process contributed information, other sources included the Road and Traffic Association of Canada (RTAC), the Ontario Trucking Association, and the Ministry of Transportation (Ontario).

The last method of data collection was the actual field investigations based upon the information obtained from the previous consultations, analyses and documents. Once the common and preferred routes were determined, an investigation team drove the routes to gain a first hand perspective of the roads, confirm reported obstructions, uncover undisclosed obstructions and determine the extent of modifications necessary to upgrade the network.

2.0 CURRENT EXCEPTIONAL LOAD ACTIVITY

2.1 INTRODUCTION

There are few characteristic exceptional load movements through Metropolitan Toronto. In many cases the routes used are not the preferred routes but the routes necessary to accommodate the load. Some of the more frequent trip types include:

(i) deliveries of specialized equipment and materials shipped into the harbour and transferred to truck and delivered into Toronto or the surrounding regions;
(ii) specialized equipment and materials produced in Metropolitan Toronto and taken to regional destinations;
(iii) prefabricated materials for large construction projects such as the Skydome;
(iv) the movement of utility poles throughout Metropolitan Toronto, and;
(v) the redistribution of portable classrooms and buildings of various types.

The first two cases tend to use routes developed by the exceptional load carriers and may be termed as common for a certain envelope of dimensions. The third case usually involves a portion of these common routes to approach a site but may only be used for the duration of the project. The last two cases involve a web of single trips throughout the region without substantial repetition.

While considering these scenarios, the concept of preserving currently frequented routes was developed to ensure the continued movement of goods and machinery from the major generators to their major destinations. This concept addresses the goal of distributing exceptional loads across the Metropolitan road network, encompassing many of the internal trips while avoiding undue burdens of specific areas of the community.

2.2 EXISTING EXCEPTIONAL LOAD LIMITS

Under the authority of the Highway Traffic Act (HTA), the Province of Ontario has defined certain maximum load dimensions for travel on the King's Highways. Similarly, Metropolitan Toronto has defined exceptional load limits within its own

by-laws and pertaining to Metropolitan Toronto roads. The Area Municipalities use the same limits as Metropolitan Toronto. While the Metropolitan Toronto and Provincial limits are similar, they are not exactly the same, causing some concern among the carriers interviewed for this study.

The maximum dimensions allowed for non-permit travel are as follows:

Dimensions	Provincial[1]	Metropolitan Toronto
Width (m)	2.6	2.6
Height (m)	4.15	3.65
Length (m)	12.5/23.0[2]	19.8
Gross Weight(t)[3]	55.0/63.5	50.0

1) HTA, Sec. 92
2) For single unit vehicle and combination, respectively
3) There are three common methods of reporting weight: gross, (as above for 3 axle cab, 2 axle trailer and 3+ axle cab, 3+ axle trailer, respectively); axle weight, and, weight per millimeter of tire surface contact.

Further limits restrict exceptional load movements through Metropolitan Toronto and the surrounding area. In Toronto, the majority of exceptional loads trips are only allowed between 12:00 a.m. and 6:00 a.m. This is due to the daylight traffic congestion experienced in the city. On Provincial Highways and surrounding Regional roadways, exceptional load trips are only permitted during daylight hours when visibility is greatest.

2.3 PERMIT SYSTEM

Metropolitan Toronto and the Area Municipalities have three types of permits: trip specific, trip specific with police escort and annual permits. The first two types are required when a further set of Metropolitan Toronto limits is surpassed. These are:

Dimension	Trip Specific Permit Required	Annual Permit Required
Width	< 3.7 m	< 2.6 m
Height	< 4.1 m	< 3.65 m
Length	< 24.5 m	< 19.8 m
Gross Weight	< 50.0 t	N/A

The annual permit is granted for loads whose dimensions fall between the two sets of Metropolitan Toronto limits and are usually given to carriers making frequent trips. As the name implies, these permits are valid for a full year and an unlimited number of trips, providing they follow certain restrictions, e.g. no peak time travel on all Metropolitan Toronto roads and no evening travel on some Metropolitan Toronto roads.

This study dealt exclusively with trip specific permits, with or without police escort.

The police escort may be required if the routes and times chosen for the trip might impede normal traffic flow. This requirement is determined by the issuing permit office. Other conditions may also apply such as electrical service escorts and specific time restrictions. Any of the Area Municipal permit offices or the Metropolitan Toronto permit office may issue an exceptional load permit pending approval of other relevant municipalities, utility companies and police departments.

2.4 USE OF EXISTING EXCEPTIONAL LOAD ROUTES

At the time of this report, there are no Metropolitan Toronto roads specifically designated as exceptional load routes. In theory, a carrier may use any Metropolitan Toronto road providing that no restrictions are breached, i.e. time of day, width and height restrictions, etc. In practice though, not every exceptional load may use any Metropolitan Toronto road. The carriers are responsible for developing a route which will accommodate their load, and although all route proposals are reviewed by municipal and utility representatives, many of the greater dimensional loads require special studies to ensure safe passage along the route. The carrier is held responsible for these studies and any damages caused by the move. It is not the intent of the study to remove this responsibility, nor to

remove the right of approval from the various agencies. A permanent exceptional load route designation will expedite the approval process by all parties knowing the available routes.

Over the years, the carriers of exceptional loads have developed a network of routes which they know as capable to handle their particular loads. This was brought out in the goods movement study through interviewing the carriers as well as being apparent in the permits. Based upon the assumption that the carriers already know and use the roads capable for their loads, it was necessary for the project team to map out these routes and use them as a foundation for the current route designation.

2.5 TRENDS AND PATTERNS OF EXISTING ROUTES

2.5.1 Route Characteristics

Examination of the recent exceptional load permits revealed three main routing types:

- frequent use corridor
- single route choices, and,
- temporary heavy use corridors.

The first type is characterized by frequent use of specific roads and corridors for the regular distribution of exceptional loads. The second type of route consists of an exceptional load movement not likely to be repeated, an example of this type is the redistribution of school portable classrooms. These route types revealed a crisscross pattern throughout the area, many of the routes chosen for a single trip and seldom repeated.

The third route type found in the analysis was that associated with major construction projects such as the Skydome. Here, a route is selected that extends from a commonly used corridor, for example Lake Shore Boulevard, to the project site. This route may be unique in the sense that it is used extensively for deliveries to the site within a short time frame. However, with a major project such as the Skydome, a large number of trips may traverse a

given route several times over a time period of several months or more than a year, giving the impression that it is a frequent exceptional load corridor. At the completion of the particular project, one or more of the roads used may not be used again for exceptional loads for some time.

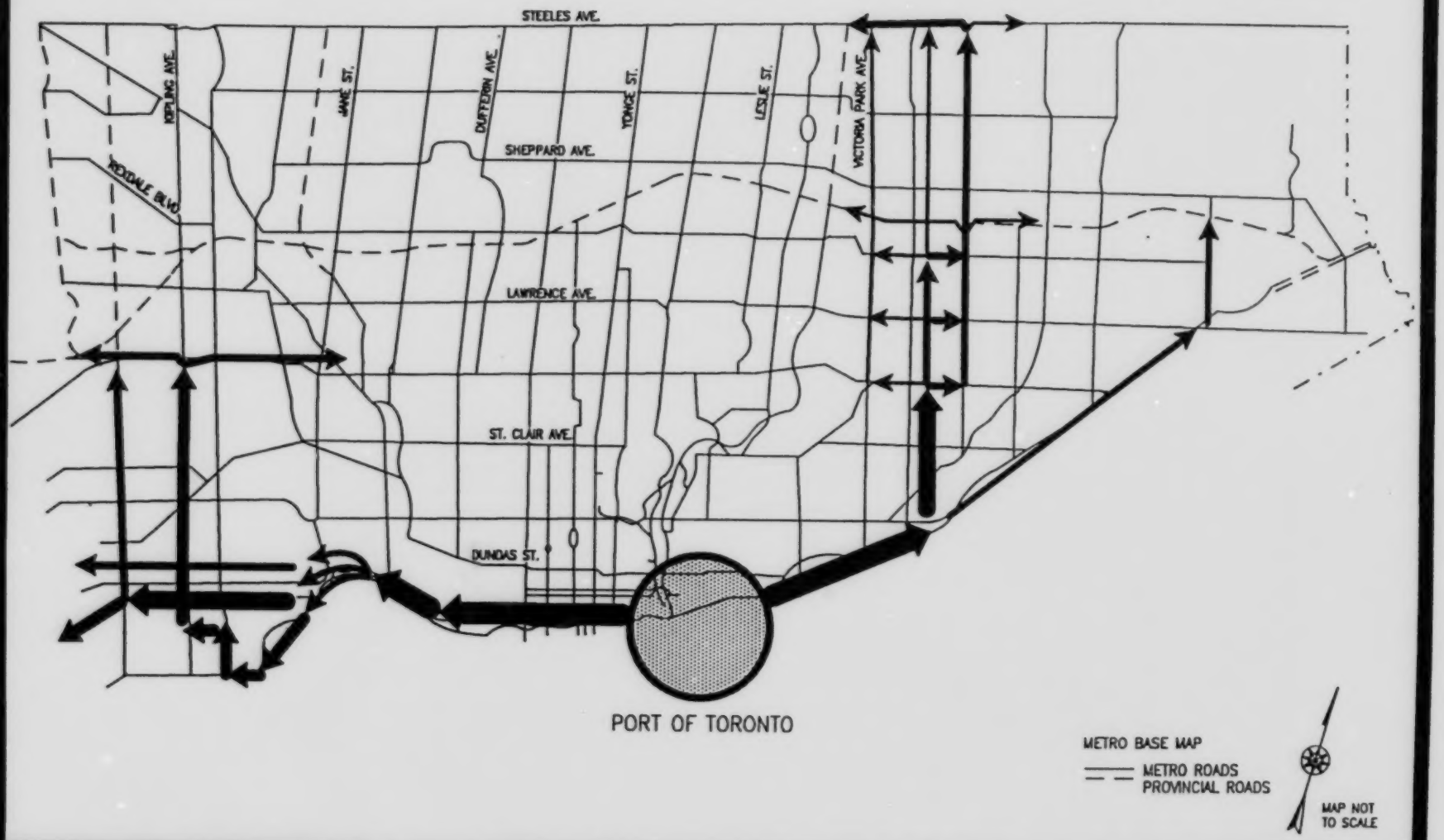
2.5.2 Major Generators

There are two common categories of trips, those internal to Metropolitan Toronto (approximately 30% of permits examined) and inter-regional trips (approximately 70% of permits). A distinction between the two trip types is made clear due to the difference in the Metropolitan Toronto and Provincial permit processes. In analyzing the Metropolitan Toronto permits, the interior Metropolitan Toronto trips were fully defined by route, from start to finish. In the case of inter-regional trips, however, the route is described only to the point where it meets the Provincial or adjacent regional component of its route. The example of an exceptional load from the Toronto Harbour to Pearson International Airport would likely follow Cherry Street, Lake Shore Boulevard, the QEW, and Hwy. 427. However, the Metropolitan Toronto permit would only define the route as Cherry Street, Lake Shore Boulevard and the QEW, beyond this the origin or destination is unknown.

The Port of Toronto is the area of greatest exceptional load traffic, generating approximately 40% of the exceptional load traffic in the Metropolitan Toronto area. The majority of trips use a westbound route which includes Cherry Street, Lake Shore Boulevard and the QEW. A significant number of outgoing trips are eastbound where they travel from Lake Shore Boulevard to Woodbine Avenue and then northeast on Kingston Road to a north/south Metropolitan Toronto or Area Municipal road in Scarborough where the will travel to Hwy. 401 or Steeles Avenue. These flows are shown in Exhibit 2.1.

Two other major generators exist in Metropolitan Toronto but not nearly to the extent of that experienced in the harbour area. The first is Bermondsey Road in East York. Here, a company that produces oversize boilers and tanks moves many loads across a regional market. The most common route for these shipments is Bermondsey Road to O'Conner Drive, then to Victoria Park

EXHIBIT 2.1: MAIN EXCEPTIONAL LOAD ROUTES TO/FROM THE PORT OF TORONTO



Avenue, where they travel north to Steeles Avenue and then, generally north on Don Mills Road or Hwy. 404 for access to Highway #7 (Exhibit 2.2).

The other major focal point of activity is Trethewey Drive, crossing the border between the Cities of York and North York. The major corridor of travel is Keele Street, from Hwy. 401 to Rogers Road and down Old Weston Road. Other frequently used roads in this area are Jane Street from Hwy. 400 to Eglinton Avenue, and Eglinton Avenue between Jane and Keele, as shown in Exhibit 2.3. Each of these two generators produce approximately 15% of the Metropolitan Toronto area exceptional load traffic.

Four areas of moderate traffic (approximately 5% of traffic each) should be pointed out:

1) Mimico - Long Branch, bordered by the Queensway, Lake Shore Boulevard and Brown's Line.
2) Midwest Scarborough, bordered by Victoria Park Avenue, Hwy. 401, Brimley Road and Eglinton Avenue
3) North Scarborough, bordered by Steeles Avenue, Markham Road, Sheppard Avenue and Victoria Park
4) Lower CBD, bordered by Bathurst Street, Lake Shore Boulevard, Yonge Street and Dundas Street.

These first three areas border existing heavy industrial areas, whereas the last one surrounds the area of recent major development projects in the Toronto Central Business District (Exhibit 2.4).

Finally, the Toronto Transit Commission (TTC) complex on St. Clair Avenue near Bathurst Street occasionally produces exceptional load trips through the delivery of new streetcars. The frequency and number of trips produced by the TTC is not as great as the areas discussed above but is as important as long as the TTC operates its streetcar service.

EXHIBIT 2.2: MAIN EXCEPTIONAL LOAD ROUTES TO/FROM BERMONDSEY DRIVE INDUSTRIAL AREA

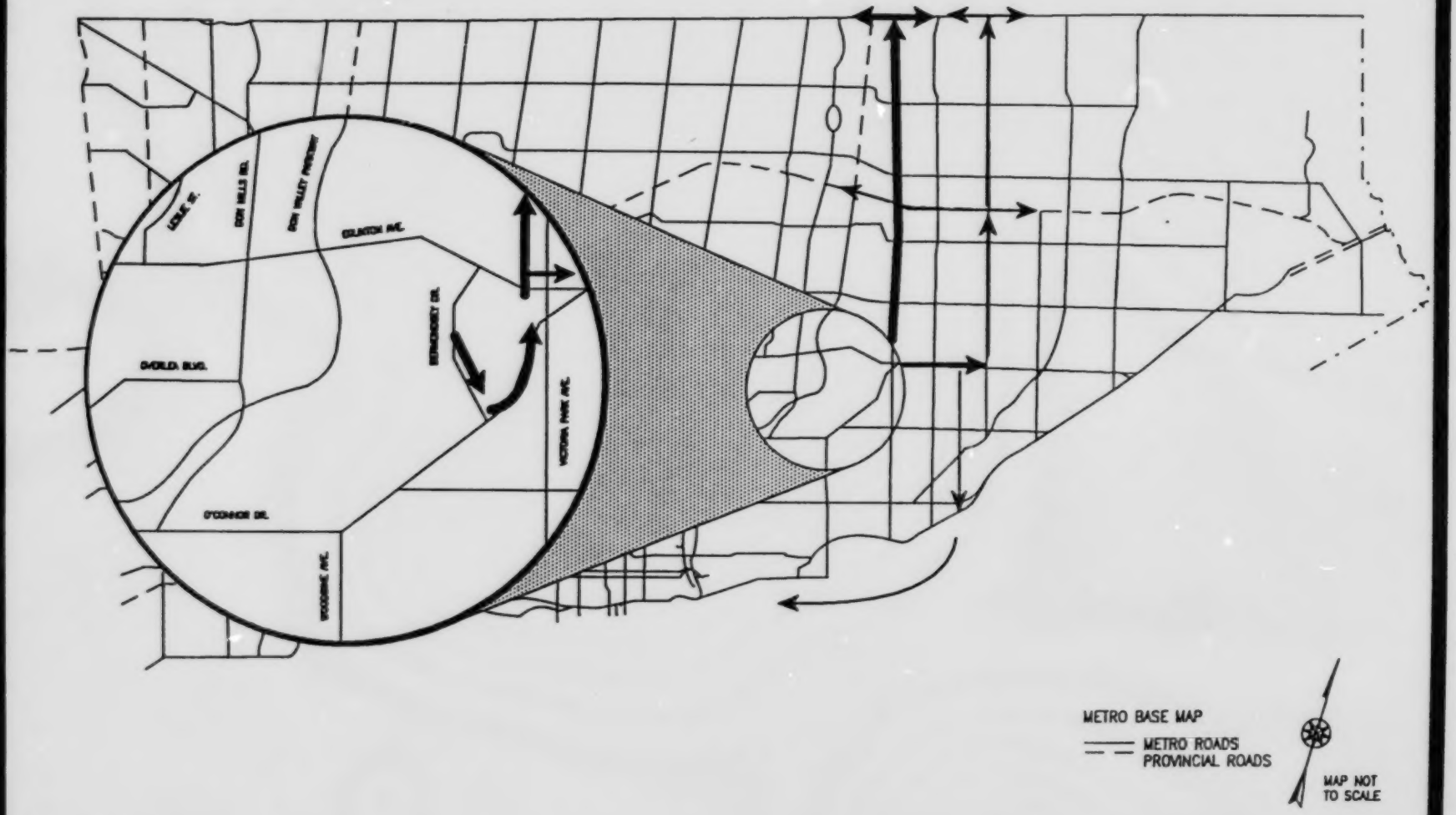


EXHIBIT 2.3: MAIN EXCEPTIONAL LOAD ROUTES TO/FROM TRETHEWEY DRIVE INDUSTRIAL AREA

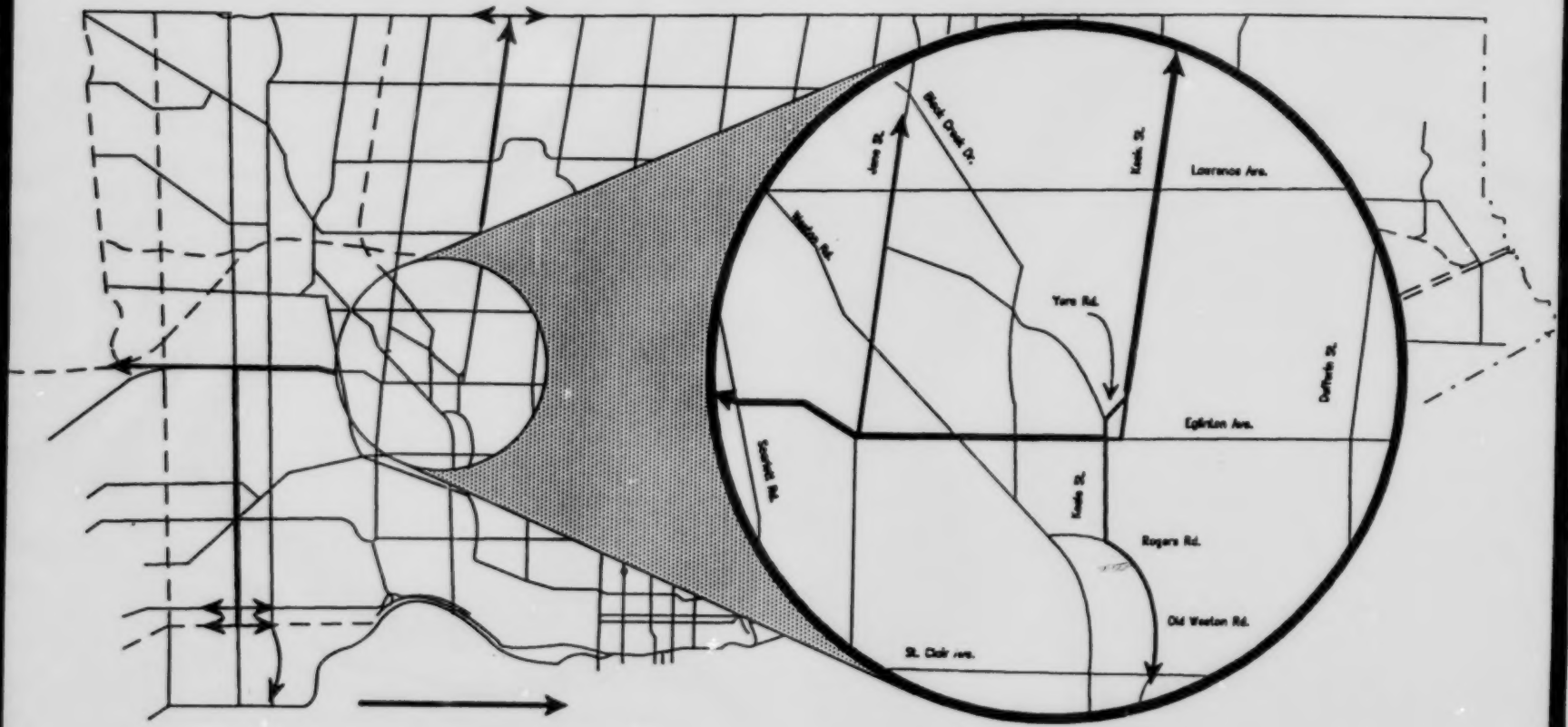
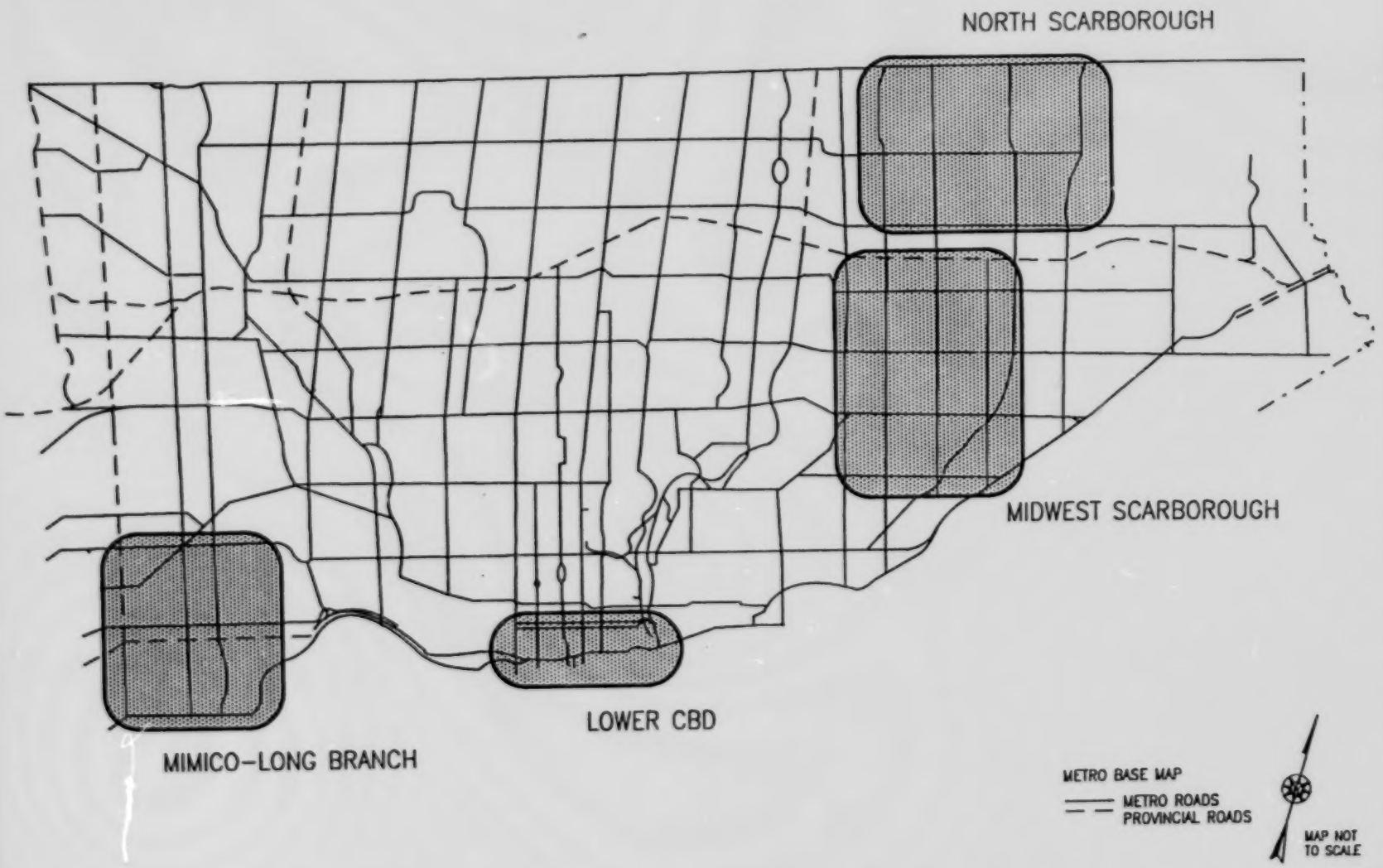


EXHIBIT 2.4: MODERATE EXCEPTIONAL LOAD TRAFFIC AREAS



2.5.3 Major Exceptional Load Corridors: Metropolitan Toronto Roads

The most common exceptional load corridors are listed below and can be seen in Exhibit 2.5. The volume of exceptional loads by dimension on each roadway is discussed in section 4.0 and shown graphically in Exhibits 4.1, 4.4, and 4.6.

MAJOR EXCEPTIONAL LOAD CORRIDORS

1) Metropolitan Toronto Roads, North - South

• Kipling Avenue	from Evans Avenue to Eglinton Avenue
• Islington Avenue	from Lake Shore Boulevard West to The Queensway
• Jane Street	from Eglinton Avenue West to Hwy. 400
• Keele Street	from Eglinton Avenue West to Steeles Avenue west, and from Rogers Road to Eglinton Avenue West
• Rogers Road	from Keele Street to Old Weston Road
• Old Weston Road	from Rogers Road to CPR tracks
• Yore Road	from Eglinton Avenue West to Keele Street
• Bathurst Street	from Wilson Avenue to St. Clair Avenue West
• Victoria Park Avenue	from O'Connor Drive to Steeles Avenue West
• Warden Avenue	from Eglinton Avenue East to Steeles Avenue East
• Kennedy Road	from Eglinton Avenue East to Steeles Avenue East

EXHIBIT 2.5: MAJOR EXCEPTIONAL LOAD CORRIDORS

- Morningside Avenue — from Kingston Road to Hwy. 401

2. Metropolitan Toronto Roads, East - West

- Lake Shore Boulevard — from Woodbine Avenue to the Peel Region Border
- The Queensway — from Islington Avenue to the Peel Region Border
- Eglinton Avenue — from Keele Street to Hwy. 401, and from Kennedy Road to Victoria Park Avenue
- Lawrence Avenue East — from Kennedy Road to Victoria Park Avenue
- Kingston Road — from Morningside Avenue to Coxwell Avenue
- Steeles Avenue — from Markham Road to Hwy. 404, and from Keele Street to Dufferin Street
- O'Connor Drive — from Bermondsey Drive to Eglinton Avenue East

3. Portions of:

- Wilson Avenue — from Avenue Road to Bathurst Street
- Avenue Road — from Wilson Avenue to Hwy. 401
- Coxwell Avenue — from Lake Shore Boulevard East to Eastern Avenue
- Woodbine Avenue — from Lake Shore Boulevard East to Kingston Road

2.5.4 Minor Exceptional Load Corridors

The following Metropolitan Toronto roads are used to a lesser degree than the above mentioned Metropolitan Toronto roads. However, they warrant mention because of their connections to the major corridors.

- Sheppard Avenue East, from Victoria Park Avenue to Morningside Avenue.
- Morningside Avenue, from Sheppard Avenue East to Lawrence Avenue East.
- Markham Road, from Steeles Avenue East to Kingston Road.
- Lawrence Avenue East, from Victoria Park Avenue to Morningside Avenue.
- Danforth Avenue/Road, from Birchmount Road to Victoria Park Avenue.
- Yonge Street, from Steeles Avenue to Lake Shore Boulevard.
- Adelaide Street, from Yonge Street to Bathurst Street.
- Bathurst Street, from Adelaide Street to Lake Shore Boulevard West.
- Finch Avenue, from Keele Street to Victoria Park Avenue.
- Weston Road, from Jane Street to Rogers Road

The minor exceptional load corridors are mapped in Exhibit 2.6.

Together, the major and minor corridors show the emerging network of frequently used exceptional load routes. This can be seen in Exhibit 2.7.

2.5.5 Provincial Corridors

Permit data from the Provincial highways was not readily available for analysis. However, it was shown by the analysis of Metropolitan Toronto exceptional load permits that the common highways are the QEW, Highways 427, 401 and 404. To a lesser extent Hwy. 27 and Hwy. 400, north of Steeles Avenue are also used.

Also revealed by the permit analysis are the Provincial interchanges chosen by the carriers as part of their route. The QEW is a common route for exceptional loads travelling south of Metropolitan Toronto. Due to the configuration of the QEW, the Frederick G. Gardiner Expressway and Lake Shore Boulevard intersection, much of the westbound exceptional load traffic from the Port of Toronto gets funnelled through this area. Some obstructions to this traffic exist here and are discussed in later sections.

EXHIBIT 2.6: MINOR EXCEPTIONAL LOAD CORRIDORS

EXHIBIT 2.7: COMBINED MAJOR/MINOR
EXCEPTIONAL LOAD CORRIDORS, METRO ROADS

It was determined that Keele Street and Kennedy Road provide good access to Hwy. 401, from the west and east respectively. The Avenue Road interchange is good for central Metropolitan Toronto exceptional load traffic. Interchanges at Markham Road, Victoria Park Avenue, McCowan Road, and Yonge Street, all provide access but are not as popular to exceptional load carriers as the others.

As for the remaining highways, the interchange at Jane Street and Hwy. 400 is popular, as is Steeles Avenue at Hwy. 404. The Provincial roadway network within Metropolitan Toronto can be seen on Exhibit 2.8, whereas the same network for the surrounding region is shown on Exhibit 2.9.

EXHIBIT 2.8: PROVINCIAL HIGHWAYS AND ROADWAYS

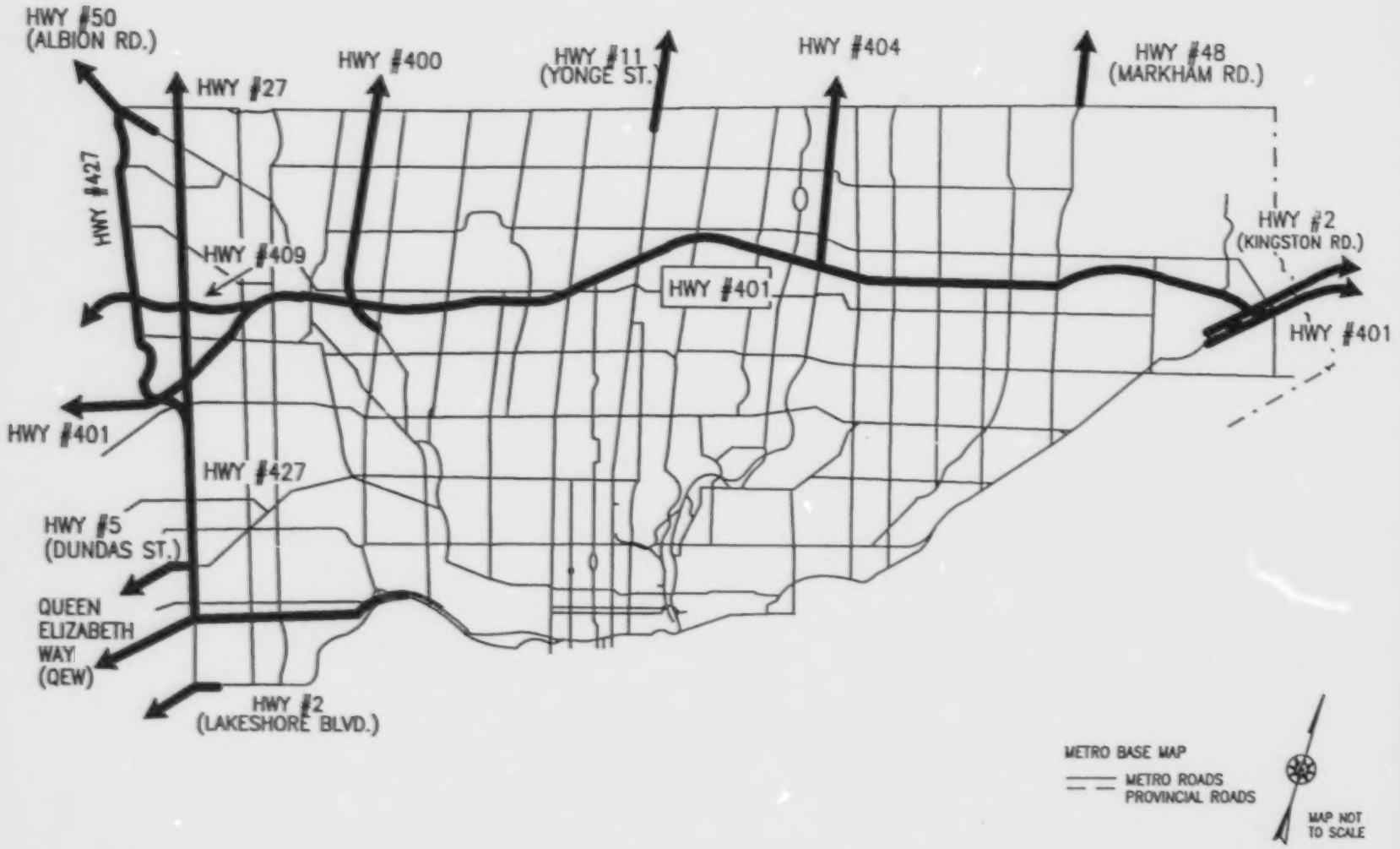
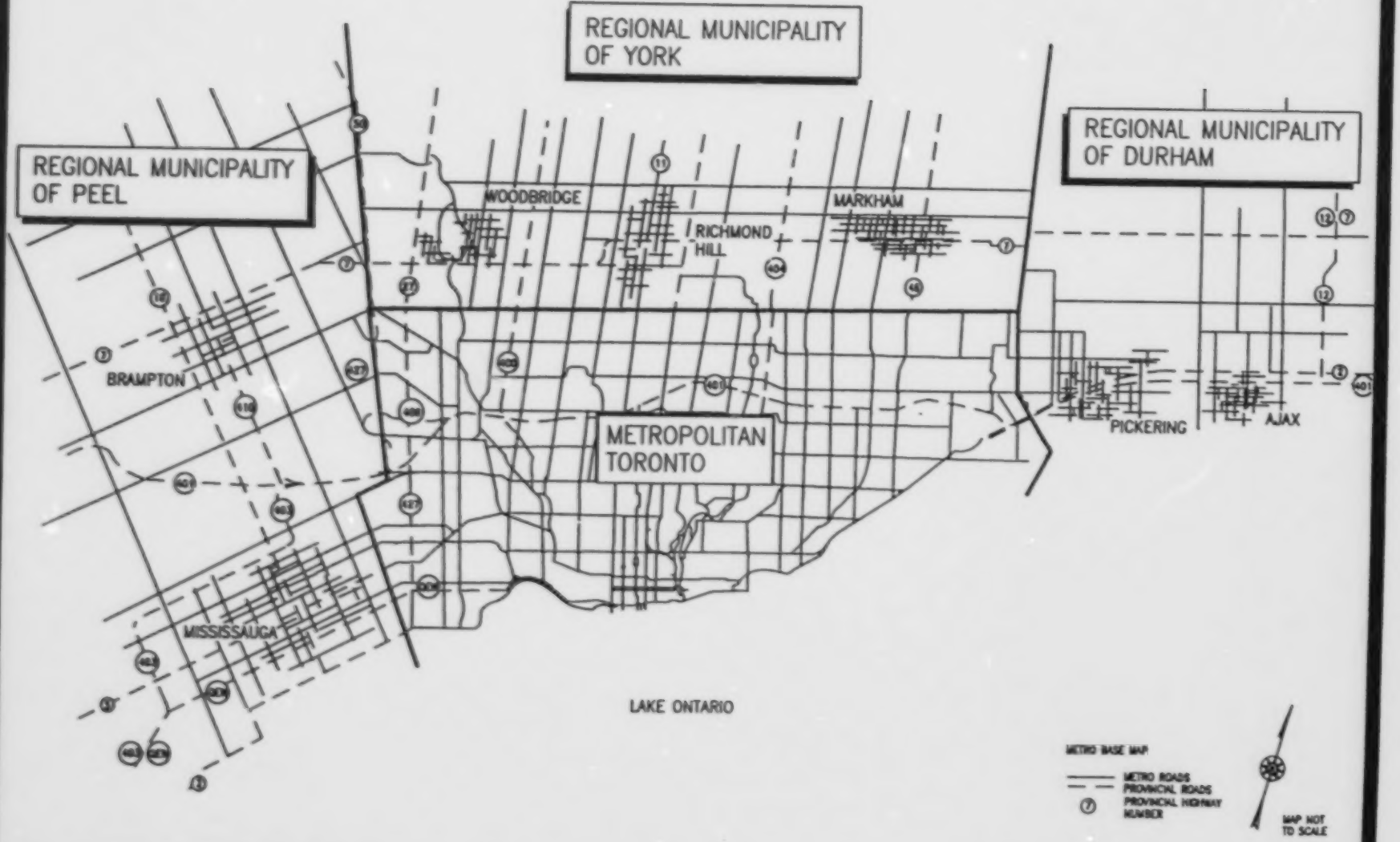


EXHIBIT 2.9: REGIONAL PROVINCIAL ROADWAYS



3.0 ESTABLISHMENT OF EXCEPTIONAL LOAD ENVELOPES

3.1 INTRODUCTION

At the time of this study, most Metropolitan Toronto roads are capable of accommodating some portion of exceptional load traffic. In many cases though, these roads have obstructions and therefore can only accommodate loads with dimensions less than the obstructions. These dimensions vary across Metropolitan Toronto roads.

This study requires a definition of an exceptional load envelope, or set of dimensions, which will apply to all roads designated in the exceptional load route. This envelope will become known as a standard for the carriers of exceptional loads and over time the carriers will know that certain designated routes will be able to accommodate their load. In addition, it will become a design guide for future construction and improvements.

3.2 PRIMARY AND SECONDARY ENVELOPES

The Primary Exceptional Load Envelope is a set of 'ideal' dimensions which will encompass the majority of exceptional load trips. However, many currently used Metropolitan Toronto roads are not capable of accommodating a very high percentage of exceptional loads due to one or more obstructions.

As an interim measure, the concept of the Secondary Exceptional Load Envelope was developed. This envelope is a set of dimensions which represents a compromise between the 'ideal', or Primary Envelope, and the current capability of each of the Metropolitan Toronto roads. The Secondary Exceptional Load Envelope provides a short term solution until the Primary Exceptional Load Envelope can be accommodated on the designated network.

3.3 ANALYSIS OF EXCEPTIONAL LOAD DIMENSIONS

The dimensions of each exceptional load were tabulated from all specific trip exceptional load permits issued by Metropolitan Toronto and the Area

Municipalities between January, 1988 and September 1989. The total number of permits issued during this time, was 683.

The data from these permits were analyzed using two different methods. First individual statistics such as the mean and frequency distribution of each dimension exceeding the Metropolitan Toronto limits were calculated and discussed below. The second method involved the analysis of loads as a combination of exceptional dimensions. That is, analysis of loads where height, the width and the length were considered together in order to produce a more realistic view of exceptional load movement.

3.3.1 Individual Analysis

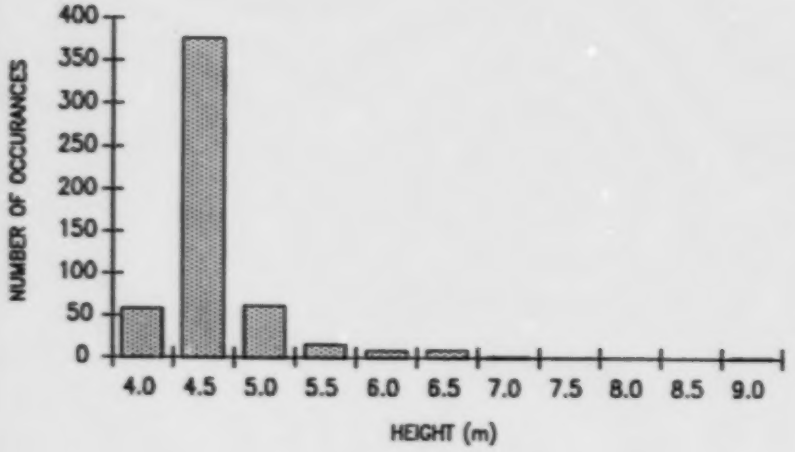
The data obtained were classified into their respective dimensions, and then analyzed to determine their arithmetic means and distributions for the time period investigated. The number of exceptional load trips for each dimension in excess of the Metropolitan Toronto limits and their means are shown below. It is interesting to note that loads having width or height in excess of the limits occur more than twice as often as the dimensions of length or weight.

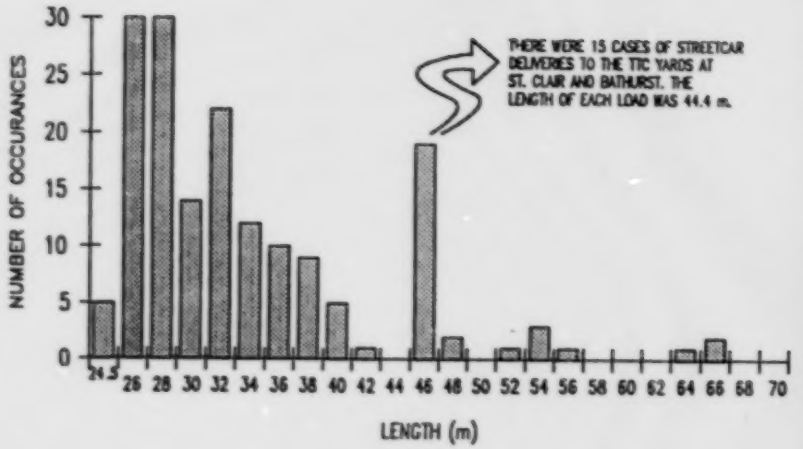
Dimension	# of trips in excess of limits[2]	Mean exceptional dimension	Metropolitan Limit
Width	476	5.41 m	3.7 m
Height	342	4.59 m	4.1 m
Length	163	33.81 m	24.5 m
Gross Weight	125	77.93 t	50.0 t

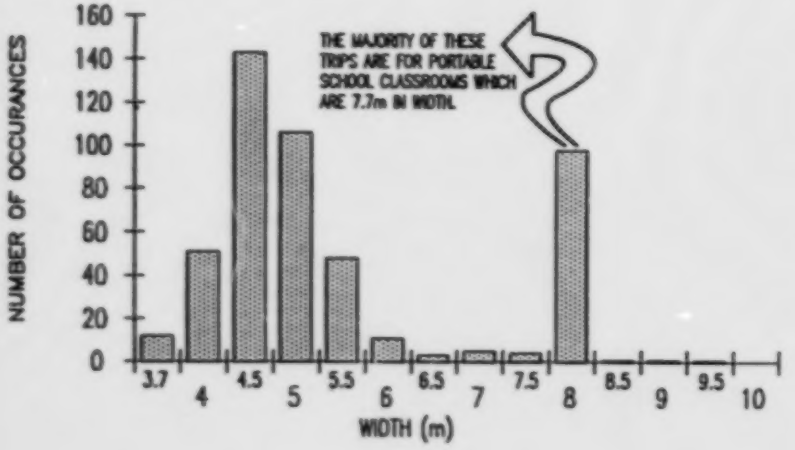
The above figures provide a basis for determining the dimensions of the exceptional load envelopes. However, more information is necessary to develop an exceptional load envelope that will accommodate the majority of exceptional loads. Exhibit 3.1 shows the distribution patterns of each of the dimensions. These histograms reveal the size of envelope required to accommodate certain percentages of exceptional load trips. Exhibit 3.1 shows that the majority of trips for most dimensions are relatively close to the

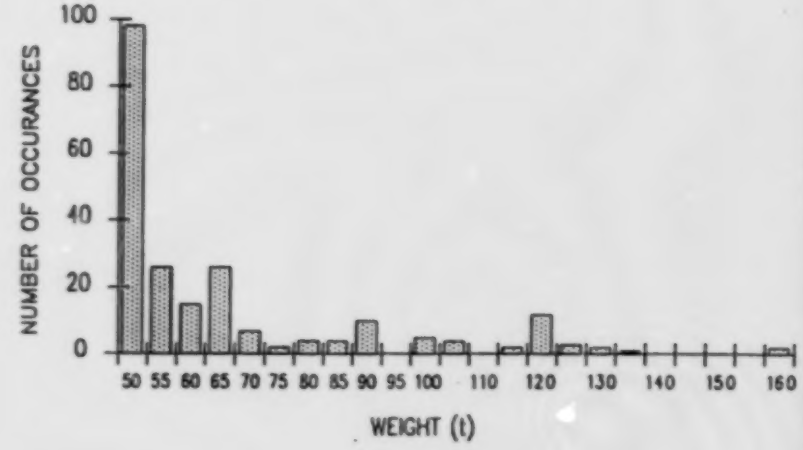
2 Includes trips where more than one dimension is exceeded.

EXHIBIT 3.1: DISTRIBUTIONS OF EXCEPTIONAL DIMENSIONS FROM PERMIT ANALYSIS




NUMBER OF OCCURANCES
30
25
20
15
10
5
0
THERE WERE 15 CASES OF STREETCAR DELIVERIES TO THE TTC YARDS AT ST. CLAIR AND BATHURST. THE LENGTH OF EACH LOAD WAS 44.4 m.
24.5 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70
LENGTH (m)





Metropolitan Toronto limits (after which a permit is required), therefore selection of an envelope to accommodate this majority should not be difficult. Exhibit 3.2 shows the cumulative frequencies of each dimension in terms of percentages. This exhibit reveals the percent of exceptional loads that would be accommodated by that specific value. For example, if the size of the width dimension was set at 6.0 metres that component would encompass approximately 76.0% of exceptional width loads.

Table 3.1 shows that the envelope to enclose 90% of all trips is not much larger than permit requirements and that a Primary Exceptional Load Envelope may well encompass a majority of these trips.

TABLE 3.1

Dimensions	Metro Limits	% of Trips 90%	95%	98%	99%	99.5%
Width (m)	**3.7**	4.7	5.4	6.4	7.7	10.3
Height (m)	**4.1**	4.8	5.4	5.9	6.5	10.8
Length (m)	**24.5**	43.5	43.9	52.3	59.5	65.0
Gross Weight (t)	**50.0**	117.6	123.5	132.9	144.3	150.8

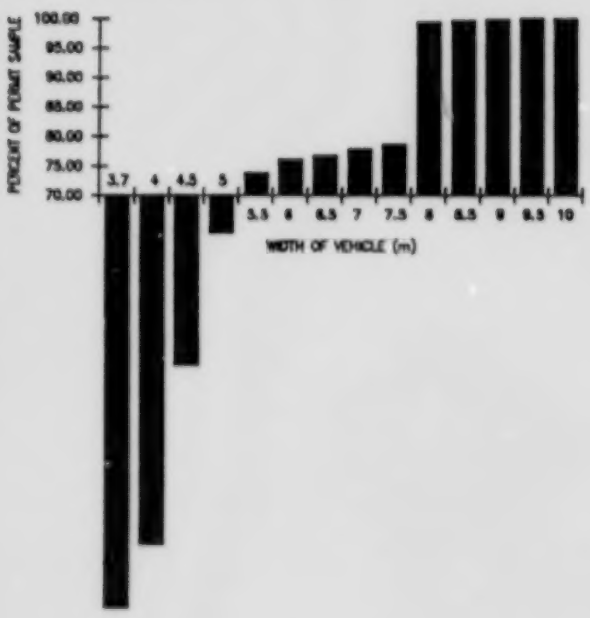
3.3.2 Combination Analysis

The procedure of analyzing exceptional load dimensions and envelopes becomes more complicated when one considers that any given load may (or may not) have more than one dimension in excess of the Metropolitan Toronto limits. With this type of analysis, sixteen potential combinations of exceptional loads are possible, i.e. from loads in which only one dimension is exceeded to loads where all four are exceeded.

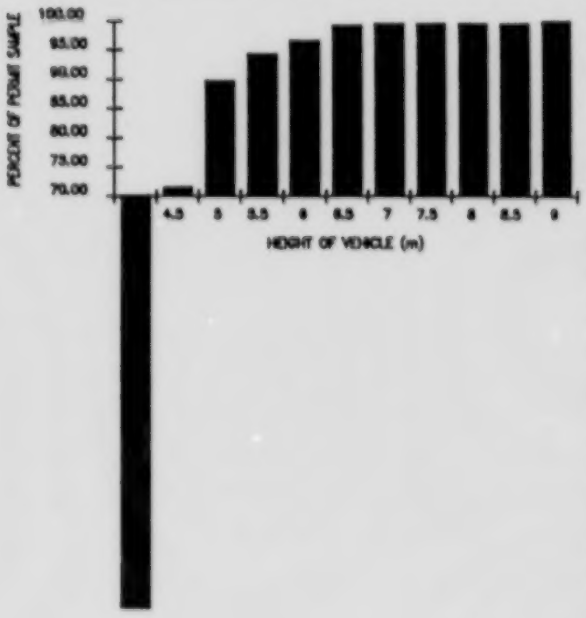
The possibility of accommodating over 90% of loads within the Primary Envelope is reduced when all four dimensions are considered together. However, this analysis shows that a high percentage is still obtainable.

EXHIBIT 3.2: CUMULATIVE FREQUENCIES OF EXCEPTIONAL LOAD DIMENSIONS

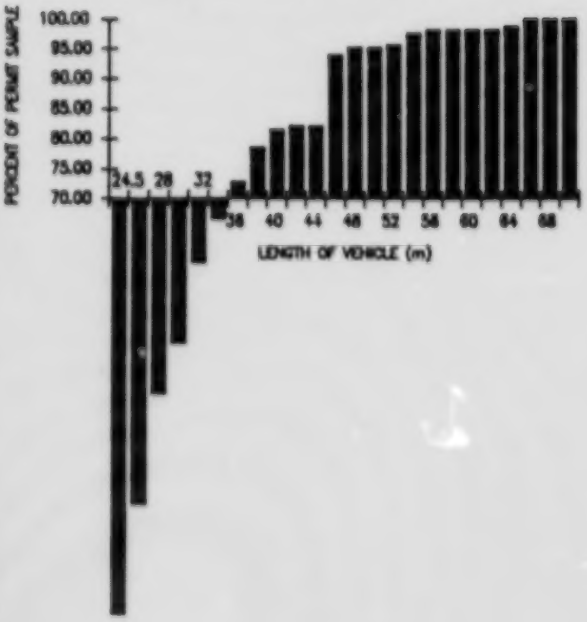
a) Exceptional Width Vehicles



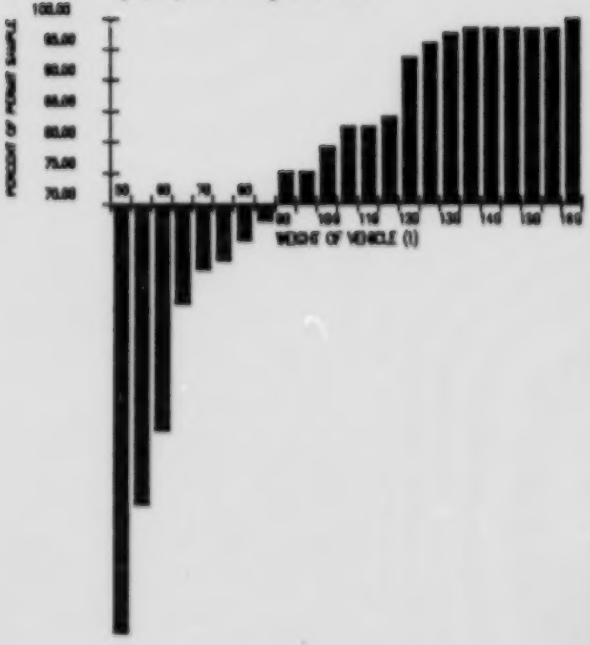
b) Exceptional Height Vehicles



c) Exceptional Length Vehicles



d) Exceptional Weight Vehicles



In order to accommodate 100% of the exceptional loads documented in the permit data, the envelope would have the following dimensions:

Dimensions	Metro Limit	Percent of Exceptional Loads 75	90	95	97.5	100%
Height (m)	3.7	5.2	5.3	5.7	6.0	6.71
Width (m)	4.1	7.6	7.7	8.0	8.0	8.53
Length (m)	24.5	36.5	36.5	44.0	45.0	47.85
Gross Weight (t)	50	120	120	160	160	160

3.4 SELECTION OF EXCEPTIONAL LOAD ENVELOPES

3.4.1 Consultations

Two suggested envelopes proved to have an influence on the selected envelopes. These were provided by the Metropolitan Toronto Goods Movement Study and the Heavy Specialized Carriers Division of Ontario Trucking Association (OTA). They are noted as follows:

Dimension	Metropolitan Toronto Goods Study	% of Sample	OTA	% of Sample
Width (m)	7.3	98.9	7.0	98.8
Height (m)	5.8	98.8	4.8/5.02[3]	92.0/95.0
Length (m)	30.5	58.8	30.5/36.5[4]	58.8/80.4

The aspect of weight has been treated differently by various groups. The exceptional load permits show the gross weight of the vehicle where the Metropolitan Toronto limit is 50 tonnes. The Metropolitan Toronto Goods Movement Study recommends 13,600 kg per 4 tire axle and the OTA recommends Ministry of Transportation Guidelines #3 for exceptional weight with a maximum of 120 tonnes gross weight. Contained within the MTO guidelines are formulae for maximum weights per axle, dependant upon the

3 Recommended for existing routes and future routes, respectively.
4 Recommended for trucks with one articulation point and more than one articulation point, respectively.

number of wheels, axles, axle spacing and tire surface contact. The OTA stated that the carriers and their vehicles could adhere to these guidelines while transporting loads of up to 120 tonnes.

3.4.2 Tentative Envelope Sizes and Further Analysis

Given these above inputs of data analysis and consultations, the following envelopes were developed as templates by which to judge the current routes. The Primary and Secondary Envelopes are shown with the percent of each dimension that would be encompassed by the envelope as per the individual analysis.

Dimension	Primary	% of Sample	Secondary	% of Sample
Width (m)	7.0	98.8	6.5	98.1
Height (m)	5.0	93.0	4.6	87.9
Length (m)	30.5/36.6[5]	58.8/75.0	30.5	58.8
Gross Weight (t)	120[6]	92.9	100	78.1

From the inputs received regarding the size of the Primary Envelope, consideration was given to the exceptional load carriers and their requested dimensions as stated in Section 3.3. This was due to their experience in exceptional load transportation, their knowledge of Metropolitan Toronto roads and because they will be the users of the final route designation.

As well as accommodating the carriers' request, the Primary Envelope had to satisfy the terms of reference from recommendation #11 of the Metropolitan Toronto Goods Movement Study which declares the Primary Envelope to encompass the "majority" of exceptional loads. Using the individiual dimension analysis (Sec. 3.3.1), it was found that the carriers' envelope fulfills 98.8% of the exceptional width trips, 93.0% of the exceptional height trips, 92.9% of the exceptional weight trips and 75.0% of the exceptional length

5 For vehicles with one and more than one articulation point, respectively.
6 Compliance with MTO guidelines #3.

trips.[7] Together, these dimensions would encompass 93.5% of the exceptional loads from the permit sample.

However, the combination analysis revealed 74%, or 506 out of 683 trips, would be accommodated by the recommended Primary Exceptional Load Envelope, whereas 62%, or 424 trips, would be accommodated by the Secondary Envelope. As expected, loads of exceptional height and width comprise the majority of trips which exceed these envelopes. A breakdown showing the percentage of each load type meeting, or exceeding the Exceptional Load Envelopes are shown in Table 3.2.

As mentioned above, part of the mandate of the study was to recommend an envelope to encompass the 'majority' of exceptional loads. While figures of 74% and 62% may seem a small majority, two considerations are presented in regard to the exceptional load environment:

1. The delivery of TTC streetcars adds several exceptional length loads of 44 m to the data, yet these trips only use a small portion of the Metropolitan Toronto road network; i.e. Avenue Road, from Highway 401 to Wilson Road; Wilson Road, from Avenue Road to Bathurst Street, and; Bathurst Street from Wilson Road to St. Clair Avenue, as shown in figure 2.7. Because of this limited route and the infrequency of the streetcar delivery (two sets in eighteen months), the effect on the overall network is minimal. When these items are removed from the data set, the Primary Envelope accommodates 76% of exceptional loads and the Secondary Envelope encompasses 62% (Table 3.3).

2. As stated previously in this report, the distribution of portable classrooms often require unique or seldom used exceptional load routes. This characteristics is mostly due to the nature of the load being non-industrial, that is, most loads are travelling to and from schools in residential areas. Typical exceptional dimensions of a portable are widths of 7.7 m and

7 If the trips associated with the TTC streetcars are treated as one trip, due to the repetition of size and the route, the percentage of exceptional length trips covered by the OTA envelope is raised to 81.9%.

heights of 4.4 m. There are two reasons for removing these trips from the data set for consideration:

i) Since the trips involve rarely used exceptional load routes that cross-cross through the area, a permanent designation of exceptional load routes for these probables would be excessive.

ii) During the time encompassing the permit data set, the Ontario Government instituted full funding to the Catholic Separate School System which caused disproportionate redistribution of portables (88 movements during the 18 months). It can be expected that in the future, the movement of portables throughout the region will be less.

If these trips were removed from the data set, the Primary Envelope would encompass approximately 89%, or 506 out of 571 trips, of exceptional loads while the Secondary Envelope would accommodate 74%, or 525 trips. The full breakdown of percentages by load types which meet or exceed the given envelopes are shown in Table 3.3.

In summary, the envelopes required to accommodate these load types are unreasonably large (shown below) and would constitute extensive and expensive modifications to the existing network. Given the reasoning stated above, not accommodating these types will not render the designation ineffective, but will still encompass a large majority of exceptional load trips.

Envelopes Requires

To Accommodate:	Height (m)	Width (m)	Length (m)	(Gross) Weight (t)	% of trips
Streetcars	5.0	7.0	44.0	120	76.13
Portables	5.0	7.7	36.5	120	89.17
Both	5.0	7.7	44.0	120	91.22

Having satisfied the above considerations of consultation and majority of trips, the final criterion was the number of modifications necessary to accommodate

TABLE 3.3: ENVELOPE COMPARISONS

DIMENSION COMBINATION	PERCENT OF LOADS EXCEEDING GIVEN LIMITS			
	WITHOUT STREETCARS		WITHOUT STREETCARS AND PORTABLES	
	SECONDARY ENVELOPE	PRIMARY ENVELOPE	SECONDARY ENVELOPE	PRIMARY ENVELOPE
NONE	63.47	74.26	75.75	88.62
WGT	0.15	0.18	0.45	0.53
LEN	4.64	5.43	2.69	3.15
LEN, WGT	1.05	1.23	0.15	0.18
WID	16.02	1.93	15.57	1.23
WID, WGT	0.00	0.00	0.00	0.00
WID, LEN	0.30	0.35	0.15	0.18
WID, LEN, WGT	0.00	0.00	0.00	0.00
HGT	10.78	12.61	4.34	5.08
HGT, WGT	1.65	1.93	0.60	0.70
HGT, LEN	0.60	0.70	0.15	0.18
HGT, LEN, WGT	1.05	1.23	0.00	0.00
HGT, WID	0.30	0.18	0.15	0.18
HGT, WID, WGT	0.00	0.00	0.00	0.00
HGT, WID, LEN	0.00	0.00	0.00	0.00
HGT, WID, LEN, WGT	0.00	0.00	0.00	0.00

any given envelope. It was found that the most extensive corrections will be required regardless of the size of the Primary Envelope, i.e. the railway underpasses cited in section 4.2.1 are at or slightly above the Metropolitan Toronto limits. Furthermore, while more corrections will be necessary to accommodate the carriers' envelope versus a smaller envelope, the additional modifications required to satisfy the carriers' are relatively minor, e.g. road resurfacing.

In terms of the Secondary Exceptional Load Envelope, these dimensions were based upon a compromise between the Primary Exceptional Load Envelope dimensions and what was currently available along the currently used routes. Since the Primary Envelope cannot be developed all at once, the Secondary Envelope becomes an interim measure until the Final Route Network is fully developed. When viewed as the entire sample of exceptional load trips within Metropolitan Toronto from January, 1988, to September, 1989, the Secondary Envelope encompasses 86.7% of the exceptional loads under the individual dimension analysis.

3.4.3 Envelope Recommendations

The processes of consultation and analysis had led to a set of dimensions tentatively selected as the Primary and Secondary Exceptional Load Envelopes. Investigation of the existing road network did show that envelopes of greater size would cause more modifications to be necessary, but a much larger increase would be required only to produce a small increase in the number of trips to be accommodated by the envelope.

Conversely, while a smaller set of dimensions would necessitate fewer modifications, the decrease in percent of loads would be greatly decreased and the major modifications would still be necessary. The Primary Exceptional Load Envelope, as tentatively selected, therefore constitutes a break-even point.

Hence, the tentative dimensions for the Primary and Secondary Exceptional Load Envelopes, as reported in section 3.4.2 (p.20) were adopted as the recommended Exceptional Load Envelope dimensions.

4.0 CURRENT USE ROUTES

4.1 INTRODUCTION

Part of the methodology of the study was to allow the exceptional load network, as it exists, to assist in the definition of the Final Network. That is, which roads are commonly used by carriers and which roads are likely to be the "best" ones available either by location, accessibility or lack of constraints.

Much of the data used and subsequent analyses were obtained from the analysis of exceptional load permits and the consultations undertaken with industry representatives and Provincial and Municipal officials.

4.2 CURRENT ROUTES BY DIMENSION

As described in Section 2 of this report, the common exceptional load corridors were uncovered by the analysis of permit and confirmed through consultation. Primary consideration was given to those routes with the highest volumes of exceptional load trips. This was determined by plotting the routes of each dimension for those which exceeded the Metropolitan Toronto limits. The following subsections describe these results.

4.2.1 Width

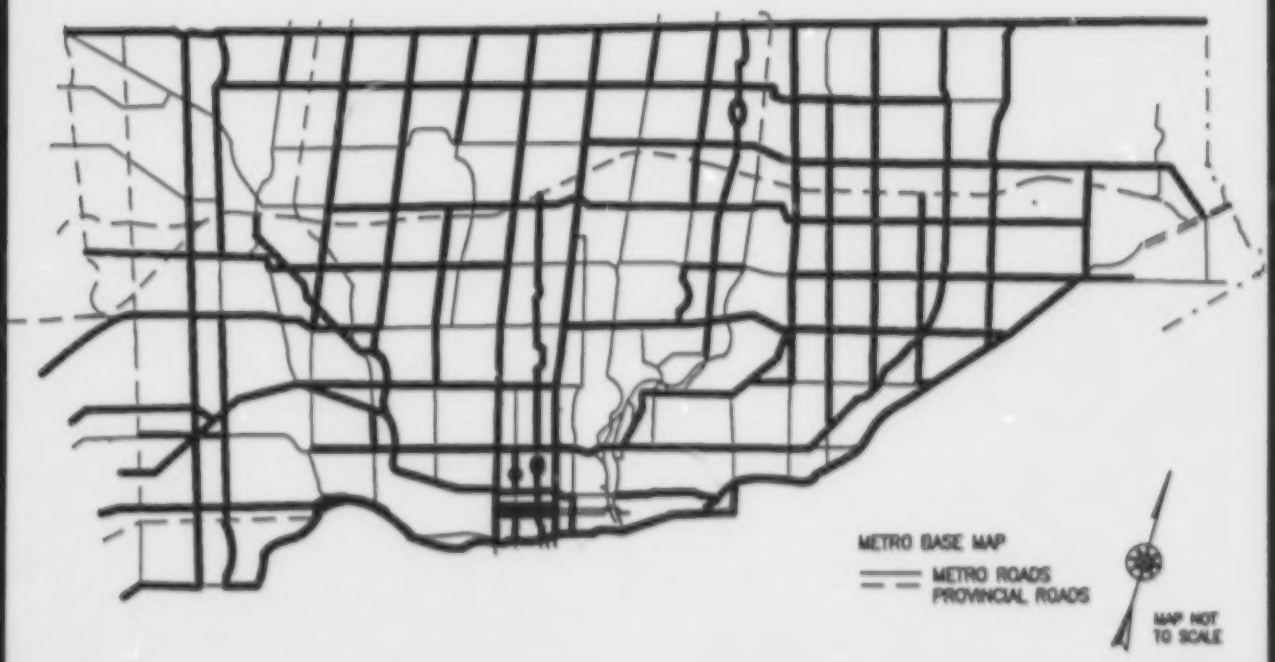
Exhibit 4.1a depicts the proportion of trips involving exceptional width loads on Metropolitan Toronto and Area Municipal roads. Immediately noticeable is the use of Lake Shore Boulevard, Victoria Park Avenue and Birchmount Road.

Because of the number of exceptional width trips and the nature of width trips, i.e. school class room portables, many roads have been used to differing degrees, both Metropolitan Toronto and area municipal roads. Simplified, Exhibit 4.1b shows the roads which were used most frequently between January, 1988 and September, 1989.

One study purpose was to remove anomalies and gaps shown in Exhibits 4.1a and 4.1b. There exist obstructions that make detours and alternate routes

EXHIBIT 4.1a: VOLUMES OF EXCEPTIONAL WIDTH VEHICLES

EXHIBIT 4.1b: METRO ROADS USED BY EXCEPTIONAL WIDTH VEHICLES



necessary. The most common obstacles encountered for exceptionally wide vehicles, as with loads of exceptional height, are railroad underpasses where both of these dimensions are limited by the design of the underpass.

There are four underpasses in Metropolitan Toronto which impede upon the commonly used routes of exceptionally high and wide vehicles:

1) Kipling Avenue, between Lake Shore Boulevard and Horner Avenue;
2) Warden Avenue, between Danforth Avenue and Kingston Road
3) Bathurst Street, between Davenport Road and Dupont Street, and;
4) St. Clair Avenue, between Old Weston Road and Caledonia Road;

Each of these necessitate the use of Area Municipal roads or less efficient routes on Metropolitan Toronto roads, as shown in Exhibits 4.2a and 4.2b.

Further obstacles exist for over width vehicles. These comprise of entry and exit ramps from one road to another. They are depicted on Exhibit 4.3 and consist of:

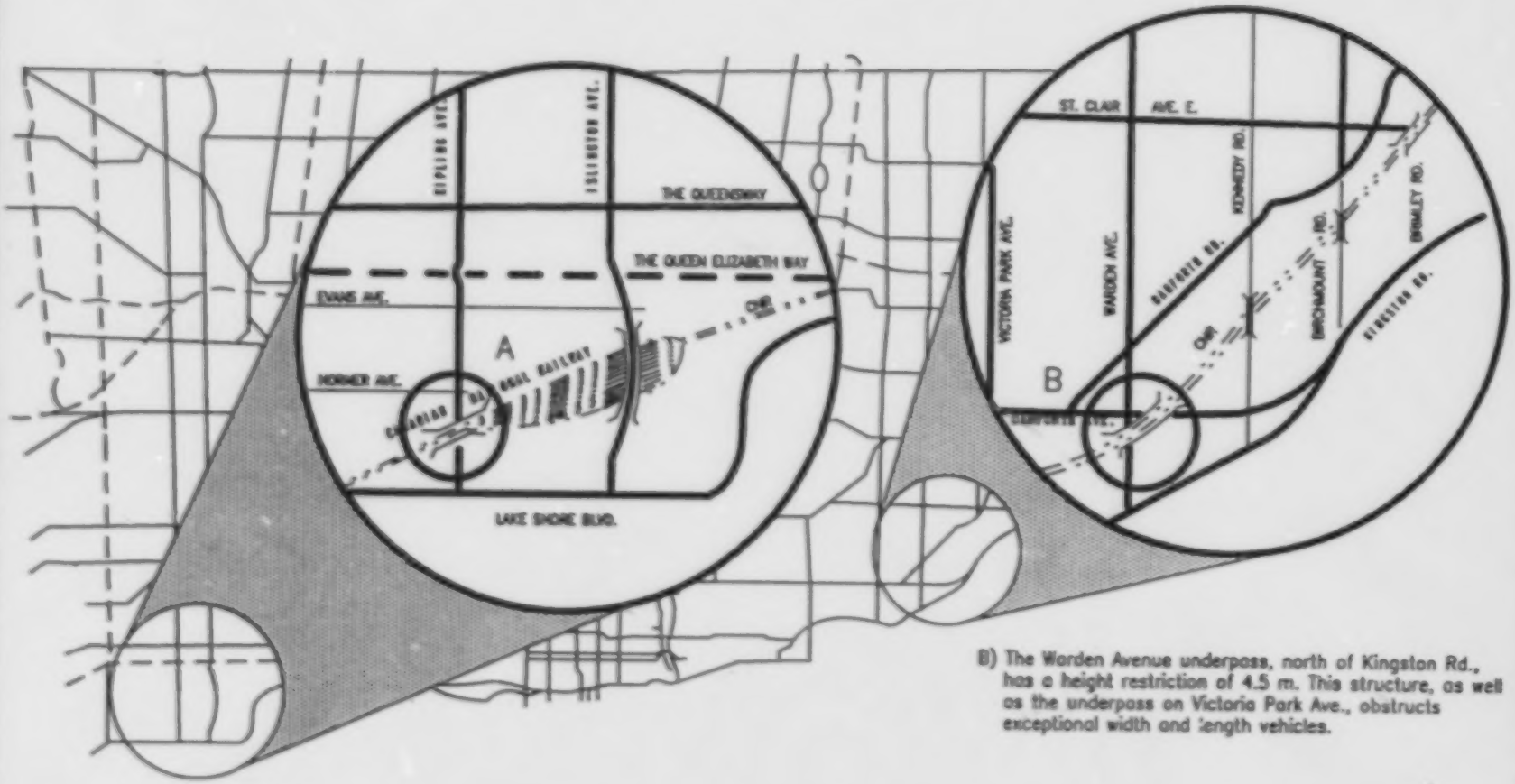
1) Both ends of Yore Road, northbound;
2) Lake Shore Boulevard at Palace Pier Court, eastbound;
3) Lake Shore Boulevard at Gardiner Expressway, eastbound, and;
4) Lake Shore Boulevard at the QEW, westbound.

Finally on those roads which have TTC streetcar service e.g., Bathurst Street and St. Clair Avenue, the pedestrian islands impinge upon the effective width of the roads and turning radii of the intersections, however, with police escorts, these loads may be safely maneuvered around the islands by utilizing both sides of the street.

4.2.2 Height

Exhibit 4.4a indicates the proportional use of Metropolitan Toronto area roads by loads exceeding Metropolitan Toronto height limits. As with the exceptional width component, the heavy use of Lake Shore Boulevard, Victoria Park Avenue, and Birchmount Road is clearly visible.

EXHIBIT 4.2a: KIPLING AVENUE AND WARDEN AVENUE UNDERPASSES



A) The Kipling Avenue underpass, north of Lakeshore Blvd., has a height restriction of 4.2 m. This structure also impedes exceptional width and length vehicles.

B) The Warden Avenue underpass, north of Kingston Rd., has a height restriction of 4.5 m. This structure, as well as the underpass on Victoria Park Ave., obstructs exceptional width and length vehicles.

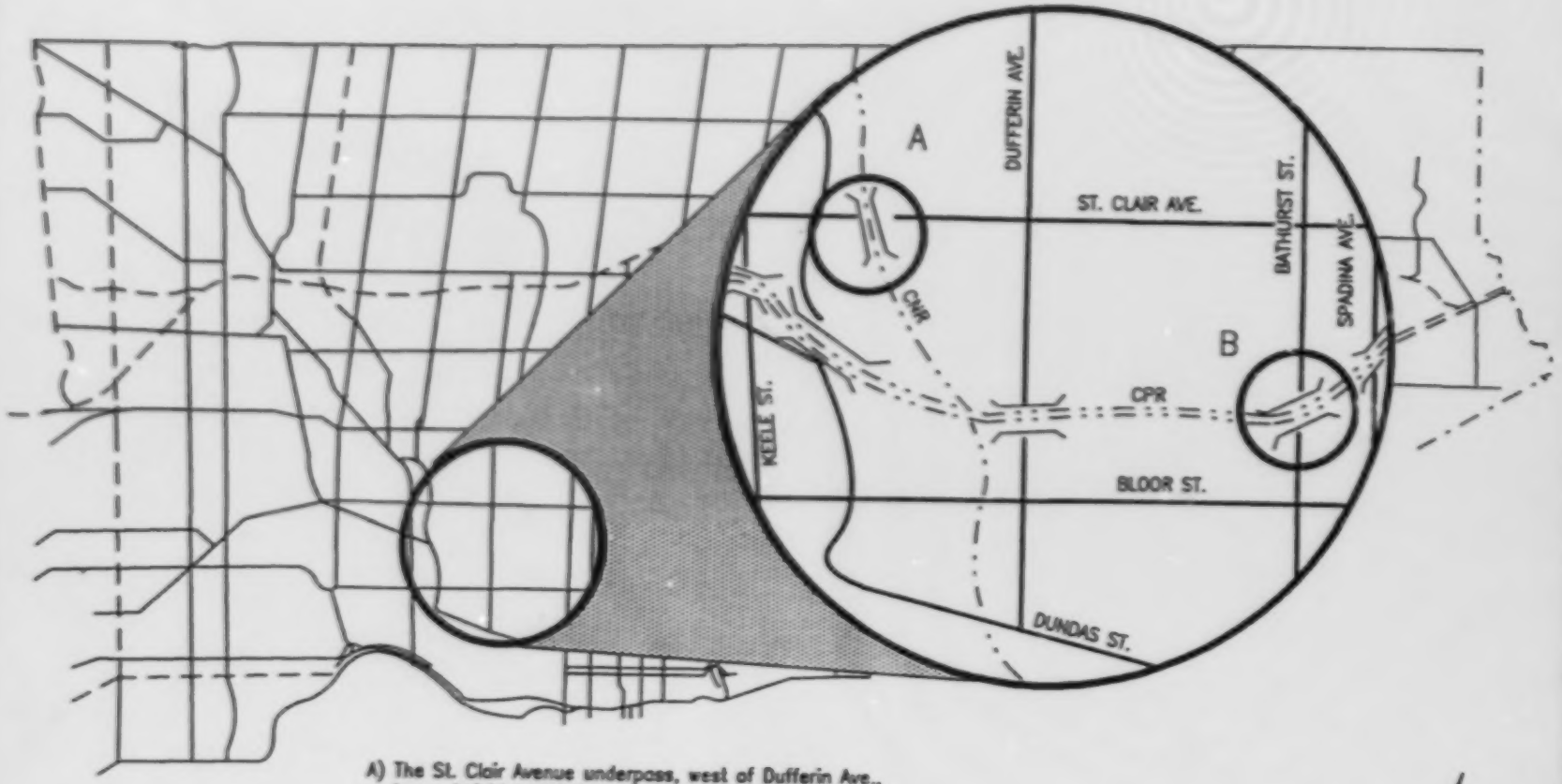
METRO BASE MAP

METRO ROADS

PROVINCIAL ROADS

MAP NOT TO SCALE

EXHIBIT 4.2b: ST. CLAIR AVENUE AND BATHURST STREET UNDERPASSES



A) The St. Clair Avenue underpass, west of Dufferin Ave., has a height restriction of 4.0 m. This structure also impinges upon the exceptional width and length envelopes.

B) The Bathurst Street underpass, north of Bloor St., has a heigth restriction of 3.8 m. As well, this underpass restricts exceptional width and length vehicles.

METRO BASE MAP

METRO ROADS

PROVINCIAL ROADS

MAP NOT TO SCALE

EXHIBIT 4.4a: VOLUMES OF EXCEPTIONAL HEIGHT VEHICLES

EXHIBIT 4.4b: METRO ROADS USED BY EXCEPTIONAL HEIGHT VEHICLES

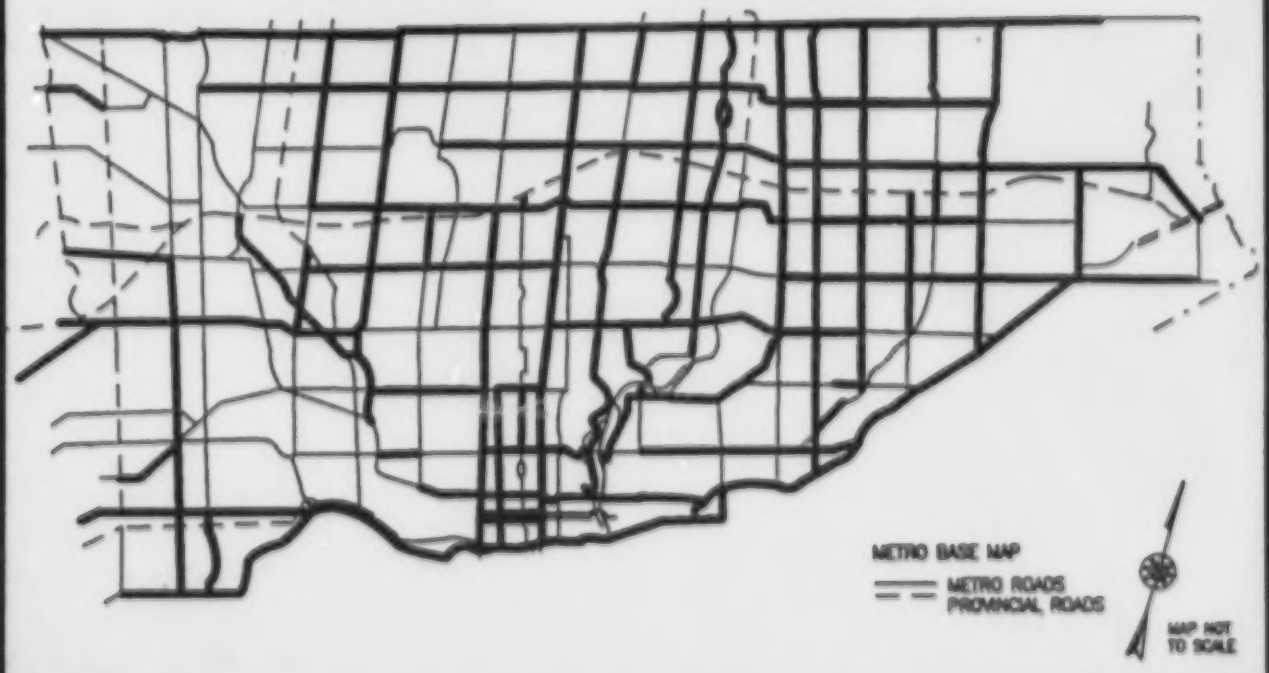


Exhibit 4.4b shows roads used by exceptional height vehicles. Similar gaps in the network are found. The problems associated with railroad underpasses described in the width subsection, apply to this dimension as well.

More prevalent than these underpasses are the obstacles presented by hydro, telephone and TTC wires. Where most of these obstacles exceed the Primary Exceptional Load Envelope of 5.0 m in height, due to the weight of ice in winter and 'heat sag' in summer, this height may encroach upon the envelope. Until all of these lines including crossover signs and traffic signal heads are routinely placed well above the 5.0 m height, an electrical and/or utility escort will be required.

Other height restrictions along the commonly used routes are listed below with their vertical clearances.

1) Wilson Avenue/ Hwy. 401 - 4.32 m both ways
2) Yonge Street/ Hwy. 401 - 4.62 m both ways
3) Markham Road/ Hwy. 401 - 4.6 m northbound, 4.62 m southbound
4) Steeles Avenue/ Hwy. 400 - 4.65 m both ways
5) Jane Street/ Hwy. 400 - 4.57 m northbound
6) Lake Shore Boulevard ramp under the QEW - 4.42 m eastbound
7) Eglinton Avenue under CNR tracks - 4.57 westbound, 4.77 eastbound
8) Eglinton Avenue under CNR at Leslie - 4.6 m westbound, 4.57 m eastbound
9) Steeles Avenue under the CNR, (east of Keele Street) - 4.66 m both ways
10) Kipling Avenue/Bloor Street/Dundas Street - 4.6 m both ways
11) Lake Shore Boulevard/ under Pedestrian Bridge(near Jameson Avenue) - 4.9 m both ways
12) Danforth Avenue/Kingston Road - 4.83 westbound
13) Eglinton Avenue/Don Valley Parkway, 4.98 m eastbound
14) Steeles Avenue/CNR (west of Leslie Street) - 4.86 m both ways
15) Bathurst Street/Hwy. 401 - 4.9 m northbound, 4.8 m southbound;
16) Eglinton Avenue, westbound to Hwy. 401 - 4.7 m; 5.0 m
17) Eglinton Avenue, eastbound from Hwy. 401 - 5.0 m

Locations of these obstacles can be seen in Exhibit 4.5.

There are two considerations involved in discussing the above limitations. First, adoption of the Primary Envelope (5.0 m) involves the rectification of more obstacles than that of the Secondary Envelope of 4.6 m. Second, many clearances cited may not be entirely accurate because of resurfacing and reconstruction of road surfaces underneath the overpasses. The first ten obstacles of the above list encroach upon the Secondary Envelope and the last seven obstruct only the Primary Envelope.

4.2.3 Length

Exhibit 4.6a shows the activity of exceptional length vehicles on Metropolitan Toronto roads. Immediately apparent is the lesser in volume of these trips. However, in comparison with other dimensions, some patterns remain the same: Lake Shore Boulevard, Victoria Park Avenue and Bathurst Street. It is also shown that the network is not nearly as extensive as the previously described components. The simplified road use map shown in Exhibit 4.6b, indicates a bare skeleton of the previous networks, but many roads remain common to the previous networks shown.

Fewer obstacles impede this type of travel as shown in Exhibit 4.6b, yet they are familiar:

1) Yore Road, Northbound;
2) Kipling Avenue, between Lake Shore Boulevard and Horner Avenue;
3) Warden Avenue, between Danforth Avenue and Kingston Road.
4) St. Clair Avenue West, west of Caledonia Road; and
5) Bathurst Street, north of Dupont Street.

Lastly, a steep angled grade change at the intersection of Cherry Street (northbound) and Lake Shore Boulevard. (westbound) frequently causes problems with exceptionally long and high vehicles. Although the grade can be safely traversed, many vehicles have spilled loads due to its deceiving perspective.

EXHIBIT 4.5: LOCATIONS OF OTHER HEIGHT OBSTACLES

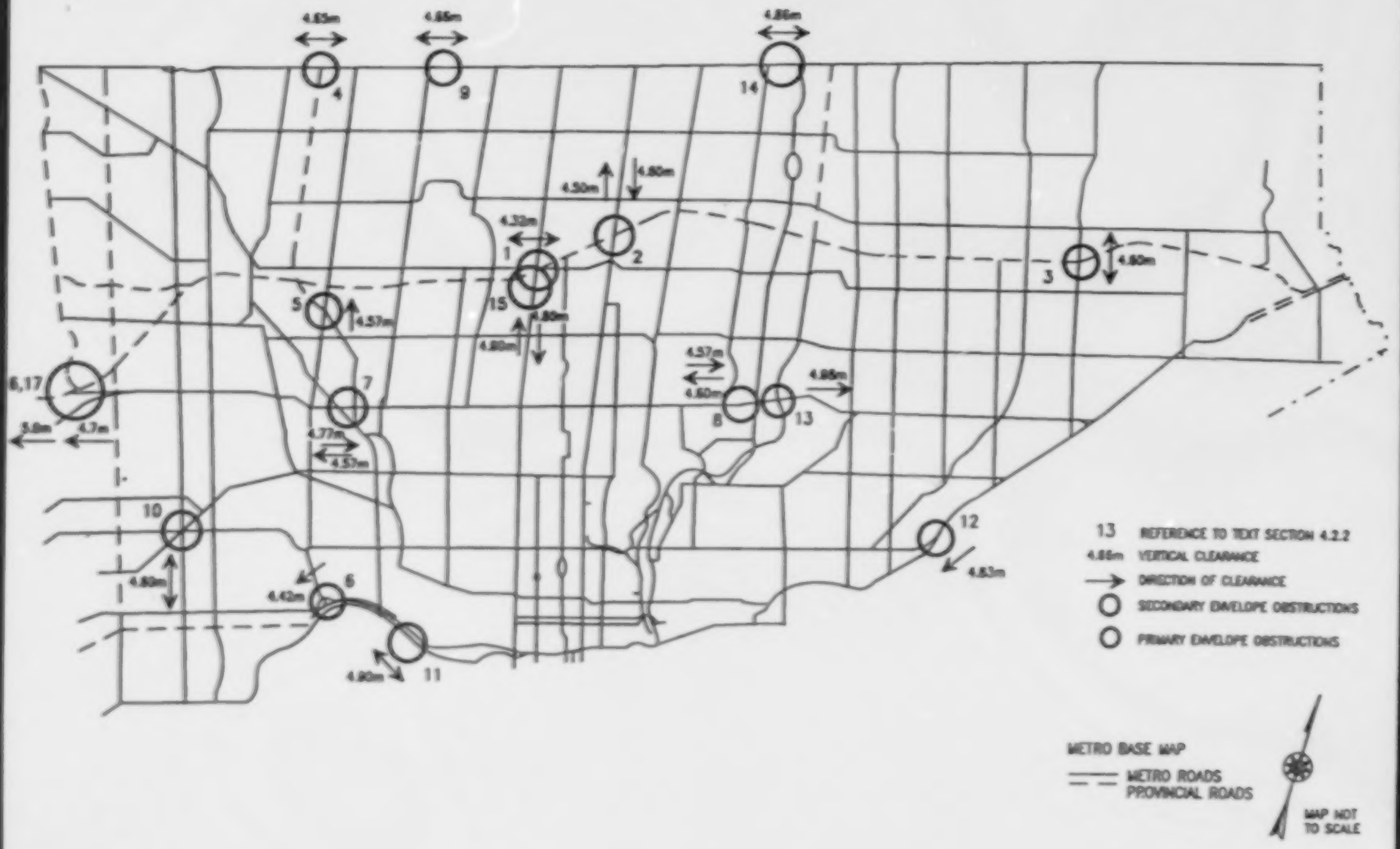


EXHIBIT 4.6a: VOLUMES OF EXCEPTIONAL LENGTH VEHICLES

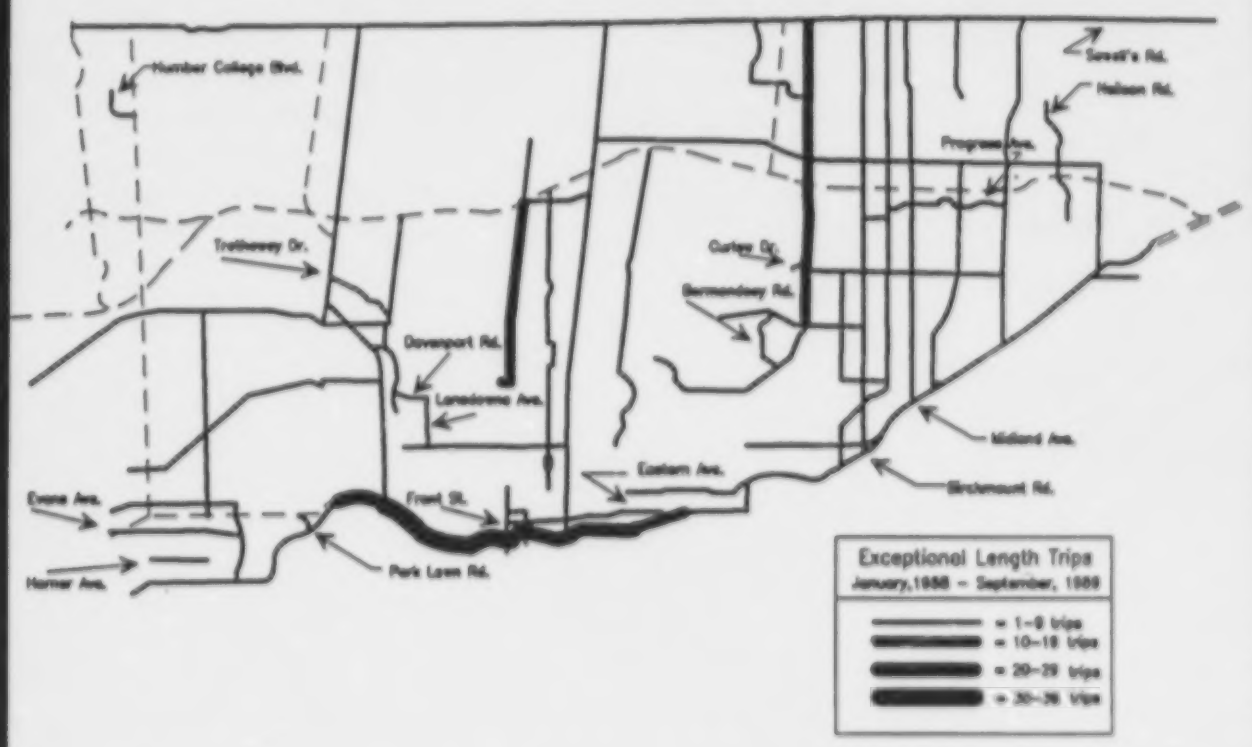
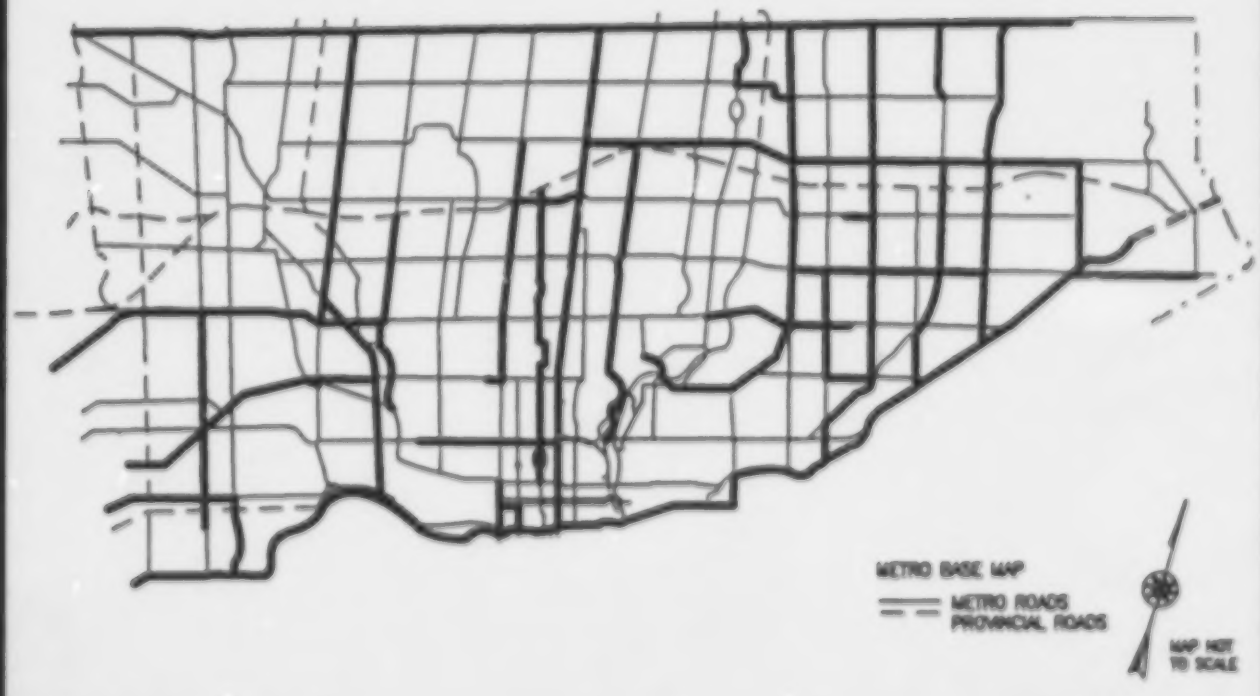


EXHIBIT 4.6b: METRO ROADS USED BY EXCEPTIONAL LENGTH VEHICLES



4.2.4 Weight

The dimension least reported to be in excess of Metropolitan Toronto limits is weight, yet it remains the most elusive in identifying its obstacles and constraints.

Weight is described in different ways: gross weight, weight per axle, and weight per millimeter of surface contact. Because of the varying designs of different vehicles and ways of distributing loads, one weight limit may be exceeded without exceeding the others, e.g. a truck's axle weight may be greater than stated limits yet its gross weight is less than the maximum. In the face of various regulations, the vehicle manufacturers have developed vehicles which can distribute a gross weight of 120 tonnes with none of the axle weights exceeding provincial limits.

The difference with the dimension of weight as opposed to the other dimensions is that damage or wear caused by weight is generally cumulative over time. In the case of weight, roads and structures must be investigated individually to assess the cumulative effects of large loads.

This study was not designed to accurately assess the weight capabilities of the roads and structures in Metropolitan Toronto. Because of the parameters needed for assessment: amount of load, frequency of trips, and expected life span, etc., careful investigation is necessary to determine the limits of these parameters and the structural integrity of each structure on the indicated routes.

4.2.5 Alternatives to Existing Routes

The selection of routes underwent a checking process to ensure that the selected routes were indeed the best available for exceptional loads. After the Final Exceptional Load Route was tentatively selected, adjoining and parallel Metropolitan Toronto Roads were investigated as to their viability as exceptional load routes.

Some of the criteria involved were:

- ease of movement without excessive circuitiveness;
- least number of diversions;
- deviance to current route network;
- zone types along routes (i.e. industrial, residential);
- scope of modifications necessary to accommodate Primary Envelope; and
- estimated cost of modifications.

Analysis showed that few of the currently used routes had any potentially viable alternatives. The following descriptions outline the findings of this analysis:

Kipling Avenue. The best alternative to the selected section of Kipling Avenue is the parallel portion of Islington Avenue. However, two underpasses on Islington Avenue between Bloor and Dundas Streets negate the utility of this alternative, plus Islington Avenue has a greater concentration of residential zones through this area and has less access to existing industrial zones.

Yonge Street. While the automobile and pedestrian congestion of Yonge Street may dissuade some from chosing this as an exceptional load route, no viable alternatives exist. Bayview Avenue on the east side has a meandering alignment, steep grades and several overpasses. Avenue Road on the west side is not a through route to York Region and provides difficult geometries at Queen's Park and the Oriole Parkway.

Steeles Avenue. Finch Avenue would seem to be an alternative to Steeles Avenue yet shows to be inferior as an exceptional load route. Steeles Avenue has many access points to York Region and connects to both Peel and Durham Regions, Finch Avenue only joins Durham Region after a difficult diversion on Meadowvale/Plug Hat/Beare Roads.. Also many of the modifications necessary to Steeles Avenue are also necessary to Finch Avenue because the obstructions (Hwy. 400, CP & 2 CN rail lines) cross both Avenues by overpass. Further, Finch Avenue has a higher density of residential zones than Steeles Avenue.

St. Clair Avenue West. The selected portion of St. Clair Avenue could feasibly be substituted with Eglinton Avenue West. This alternative, however, has its disadvantages:

- Eglinton Avenue already has high traffic congestion and the addition of exceptional loads will only add to this condition, and

- St. Clair provides a better connection from the Tretheway Drive and Old Weston Industrial Areas to the Port of Toronto.

Remaining Roads. The remainder, except for the Victoria Park Road/Kennedy Road Corridor in Scarborough, have no viable alternatives. Alternatives to the Scarborough corridor have been outlined elsewhere in this report and are dependent upon the priorities of the Metropolitan Toronto Government.

5.0 ROUTE DESIGNATION

5.1 INTRODUCTION

The underlying philosophy of the network selection process was to allow the currently used network to reveal itself through the analysis of consultation permits. There are two main reasons to follow this philosophy: firstly, the current route selection is presumably the best available to the carriers, and secondly, the current route network services the areas which frequently produce exceptional loads in Metropolitan Toronto. Exhibit 5.1 shows the Metropolitan Toronto roads common to all four dimensions. Exhibit 5.2 builds a more extensive network showing roads common among three or more dimensions.

While a basic network can be derived from what exists presently, two more concerns must be addressed for the final route selection:

1. To allow for freer movement of exceptional load traffic throughout the Metropolitan Toronto Area.

   The "ideal" situation would be to designate all Metropolitan Toronto roads as part of the network, however, this would be a costly venture for the maintenance of the network. Since all roads cannot be designated, yet many are needed, a limit must be drawn so as to accommodate the needs of the industry without being excessive.

2. To address the need for alternate routes. Should one of the designated roads be temporarily shut down due to construction or obstruction, the carriers would need a diversionary route to deliver the exceptional load.

   While a different set of roads would be ideal for alternate route selection, this process would involve another close examination and study to determine capabilities and necessary modifications. However, due to the connections throughout the current network, which will comprise the final Primary Network, alternates to any given route will be inherent in the final Primary Network.

EXHIBIT 5.1: METRO ROADS COMMON AMONG FOUR DIMENSIONS

EXHIBIT 5.2: METRO ROADS COMMON AMONG THREE OR MORE DIMENSIONS

Due to the constraints that presently exist within the Metropolitan Toronto road system, a complete designation is not possible without a number of modifications. Given time and priority considerations, a phased system modifications and designations is desirable to achieve the full Final Route Designation.

Phase 1: Proposed Current Route Designation

Step
1) Designate Secondary Exceptional Load Exceptional Load Envelope;
2) Designate Current Exceptional Load Route for Secondary Envelope;
3) Prepare for Interim Route through discussions with Area Municipalities;
4) Undertake comprehensive load review of bridges and structures.

Phase 2: Proposed Interim Route Designation

Step
1) Undertake modifications necessary to upgrade Current Route to the Interim Route Classification;
2) Designate Interim Route for the Secondary Envelope.

Phase 3: Proposed Final Route Designation

Step
1) Undertake remaining modifications necessary to upgrade the Interim Route Network to accommodate the Primary Envelope;
2) Designate Primary Exceptional Load Envelope;
3) Designate Final Load Route Network.

5.2 PHASE 1: PROPOSED CURRENT ROUTE DESIGNATION

5.2.1 Step 1) Designate Secondary Exceptional Load Envelope

As discussed in section 3.2, two envelopes have been developed, the Primary and Secondary Exceptional Load Envelopes. In this, the first step, the Secondary Envelope is to be designation temporarily so as to provide a more expansive network, prior to modifications. As these corrections are made, this network will be expanded both by the number of roads and by the dimensions of the envelope.

The following figures outline the proposed secondary exceptional load envelope and its corresponding design standards. These design standards are considered a guideline for future design of development near the exceptional load envelopes. That is, the standards allow for free space between the potential obstruction and the exceptional load. The following Secondary Envelope and its corresponding design standards are recommended:

Secondary Envelope		Design Standards
Width	6.5 m	6.7 m
Height		4.6 m 4.7 m
Length	30.5 m	30.5 m (single articulation only)
Gross Weight	100.0 t	120.0 t (MTO guidelines #3)

5.2.2 Step 2) Designate Current Exceptional Load Route Network For Secondary Envelope

This step requires the designation of Metropolitan Toronto roads that will eventually comprise the Interim and Final Networks. However, due to existing obstructions within the Secondary Envelope described above, the Current Exceptional Load Route has some dimensional restrictions. The Current Route is shown in Exhibit 5.3 and the restrictions are listed below:

EXHIBIT 5.3: PROPOSED CURRENT ROUTE DESIGNATION FOR THE SECONDARY EXCEPTIONAL LOAD ENVELOPE, PHASE 1

Width

1) Yore Road, capable southbound only. Northbound to use Keele/Eglington/Keele Streets
2) Lake Shore Boulevard, eastbound on-ramp, east of Palace Pier Court. While a load of 6.5 m in width may be accommdated, the clearance does not conform to the secondary design clearance of 6.7 m.

Height

1) Kipling Avenue, height restriction under Bloor/Dundas streets. Alternatives are:

Southbound:	Kipling Avenue, South to Bloor Street, Bloor Street West to Aukland Road*, Aukland Road south to Dundas Street, Dundas Street East to Kipling Avenue (south) on-ramp.
Northbound:	Kipling Avenue, north to Bloor Street (east) off-ramp, east on Bloor Street to Dunbloor Avenue to Dundas Street, west on Dundas Street to Kipling Avenue (north) on-ramp.

2) Lake Shore Boulevard, under the QEW/Frederick G. Gardiner Expressway, eastbound has a height restriction.
3) Jane Street, at Hwy. 400 is capable southbound only due to height restriction on Jane Street northbound to the Hwy. 400 on-ramp.
4) Eglinton Avenue, has a height restriction under the CN/CP tracks between West Road and Black Creek Drive.[8]

Length

1) Yore Road, capable southbound only. Northbound to use Keele/Eglington/Keele Streets.
2) Cherry Street, at the junction with Lake Shore Boulevard, grade problems crease a load shifting hazard.

8 Aukland Avenue is under the jurisdication of the City of Etobicoke.

Weight

Due to time and monetary constraints, extensive and accurate investigations of the roads and structures along the chosen network was not possible, therefore calculation of their capabilities and constraints is not available.

While 125 exceptional weight trips were permitted from January, 1988 to September, 1989, on Metropolitan Toronto roads, it must be empahsized that:

all exceptional weight trips be subjected to the present permit procedures until a comprehensive load review is completed on the roads and structures of the Interim and Final networks (see also Sec. 5.2.4).

5.2.3 Step 3) Prepare for Interim Route

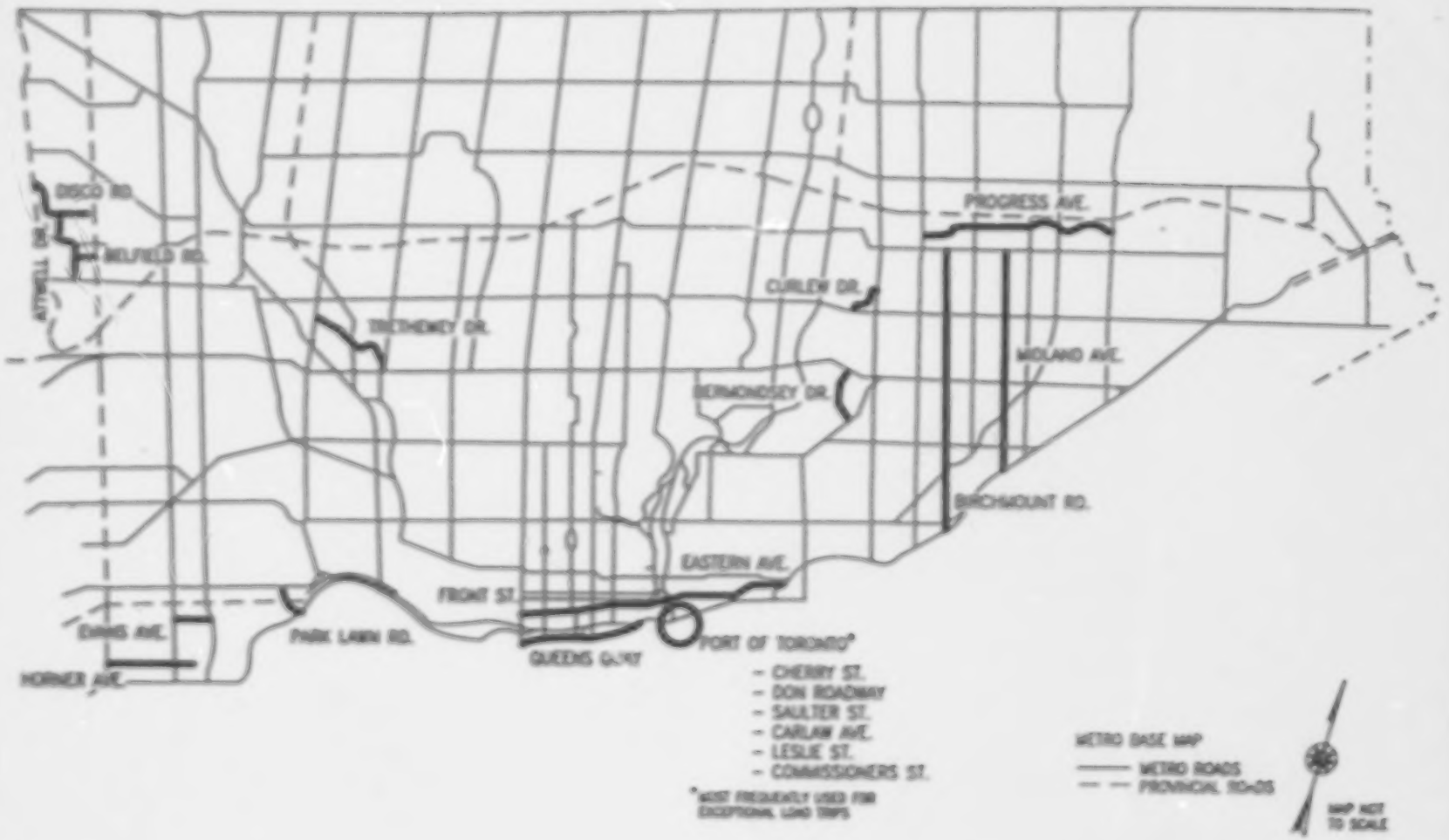
Much of the network described above contains gaps which necessitate the use of Area Municipal roads as detours. These can continue to be used as they are well known to the carriers and remain as the only viable alternatives to the envelope constraints on Metropolitan Toronto roads. These Area Municipal roads are integral to the network and are needed as part of the designation until modifications are made to the chosen Metropolitan Toronto road network.

The Area Municipal roads within the Interim Network are shown in Exhibit 5.4 and listed below:

Etobicoke:

1) Evans Avenue, from Kipling Avenue to Islington Avenue
2) Park Lawn Road, from the Queensway to Lake Shore Boulevard.
3) Aukland Avenue, from Bloor Street south to Dundas Street.

EXHIBIT 5.4: AREA MUNICIPAL ROADS INTEGRAL TO THE CURRENT AND INTERIM NETWORKS



Scarborough	1) Birchmount Road, from Kingston Road to Ellesmere Road
Toronto	1) Port of Toronto roads (see Section 6.3.1)

Other Area Municipal roads which are not integral to the Metropolitan Toronto network yet are access roads to the exceptional load corridors are:

East York:	1) Bermondsey Road, all
Etobicoke:	1) Disco Road, all 2) Attwell Drive, all 3) Belfield Road, from Attwell to Hwy. 427
North York:	1) Trethewey Drive, from Jane Street to City of York Border 2) Curlew Drive, all
Scarborough:	1) Midland Avenue, Kingston Road to Hwy 401 2) Progress Avenue, from Kennedy Road to Markham Road
Toronto:	1) Front Street, from Bathurst Street to Eastern Avenue 2) Eastern Avenue, from Front Street to Kingston Road 3) Queen's Quay, all[9]
York:	1) Trethewey Drive, from City of York Border to Yore Road

[9] As alternative during construction and for infrequent yet significant, trips exceeding the primary envelope.

5.2.4 Step 4) Undertake comprehensive review, as necessary, of bridge structures and road bases on proposed exceptional load routes.

The following information should be compiled for each structure:

a) statistical frequency of exceptional weight trips (i.e. greater than 50 tonnes);
b) distribution of size of loads;
c) effects of these on the life span of the structure or road, and;
d) decision on limit criteria.

5.3 PROPOSED PHASE 2: INTERIM ROUTE NETWORK

5.3.1 Step 1) Undertake modifications to expand Current Network to accommodate Secondary Exceptional Load Envelope. Where convenient, make major modifications recommended for Phase 3.

The following modifications include components necessary to upgrade infrastructures to the Secondary Envelope design standards (Phase 2) and may include the further modifications to upgrade to the Primary Envelope design standards (Phase 3). The locations for these modifications can be found on Exhibit 5.5.

It should be noted that modifications involving provincial structures may involve that cooperation of the Ministry of Transportation (MTO). Therefore, Metropolitan Toronto should initiate discussions with MTO as soon as possible to ensure a timely response and modifications to coincide with the intended implementation plan.

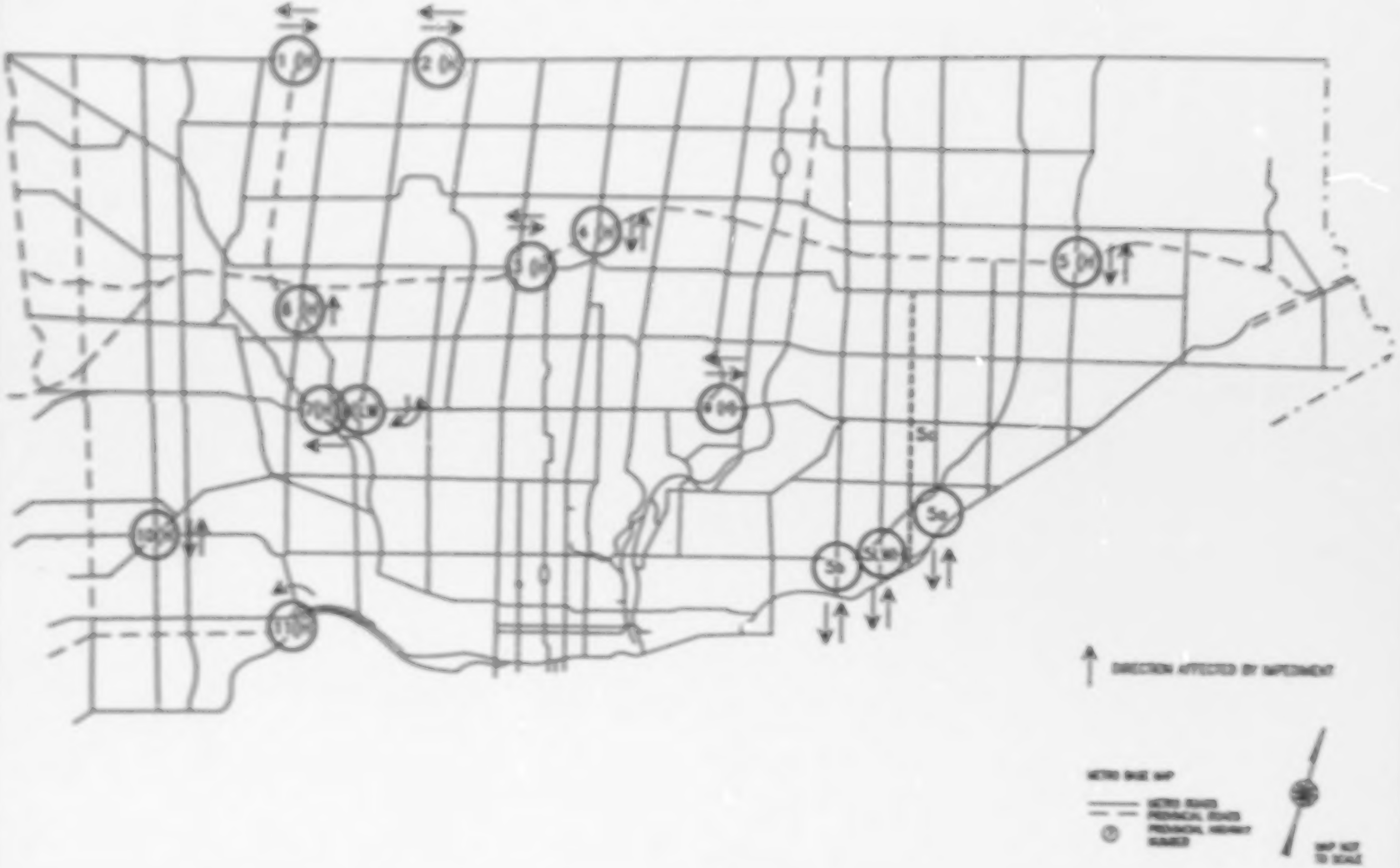
1) Steeles Avenue, under Hwy. 400:
   increase height clearance 0.05 m (phase 2)
   or increase height clearance 0.45 m (phase 3).

2) Steeles Avenue, under CNR tracks between Keele Street and Dufferin Street:
   increase height clearance 0.04 m (phase 2)
   or increase height clearance 0.44 m (phase 3)

3) Wilson Road, under Hwy. 401:
   increase height clearance 0.38 m (phase 2)
   or increase height clearance 0.78 m (phase 3).

4) Yonge Street, under Hwy. 401:
   increase height clearance 0.20 m northbound, 0.10 m southbound (phase 2)
   or increase height clearance 0.60 m northbound, 0.50 m southbound (phase 3)

EXHIBIT 5.5: PHASE 2 ROUTE MODIFICATIONS



5) Warden Avenue, under CPR tracks between Kingston Road and Danforth Avenue:

increase height clearance 0.20 m (phase 2)
or increase height clearance 0.60 m (phase 3)
and widen road to 3, 4 lanes (phase 3)
and grade levelling.

5a) Alternate to (5): Kennedy Road,

Kennedy Road completion from Danforth Road to Kingston Road (phase 3)
and widen Kennedy road to 3, 4 lanes (phase 3)
and ensure existing overpass is exceptional load capable to primary envelope (phase 3)

5b) Alternate to (5): Victoria Park Avenue, south of Danforth Avenue,

increase height clearance 0.60 m (phase 2)
or increase height clearance 1.0 m (phase 3)
and widen road to 3, 4 lanes (phase 3).

5c) Alternate to (5): Birchmount Road, in its entirety,

assume Birchmount Road as a Metropolitan Toronto road, designate as exceptional load route
or enter into agreement with City of Scarborough for co-designation

6) Jane Street under Hwy. 400:

increase height clearance 0.13 m (phase 2)
or increase height clearance 0.53 m (phase 3).

7) Eglinton Avenue, CNR overpass between Weston Road and Black Creek Drive:

increase height clearance westbound 0.13 m (phase 2)
or increase height clearance westbound 0.53 m (phase 3)
and increase height clearance eastbound 0.33 m (phase 3)

8) Yore Road, full length:

widen exceptional load envelope to 6.5 m (phase 2)

or widen exceptional load envelope to 7.0 m (phase 3)

8a) Alternate to (8): existing route,

continue use of Eglinton/Keele detour for all northbound exceptional load traffic

9) Eglinton Avenue, CPR overpass east of Leslie:

increase height clearance 0.15 m (phase 2)

or increase height clearance 0.55 m (phase 3).

10) Kipling Avenue, under Bloor Street/Dundas Street:

increase height clearance 0.40 m (phase 2)

or increase height clearance 0.80 m (phase 3).

11) Lake Shore Boulevard, westbound ramp under QEW:

increase height clearance 0.28 m (phase 2)

or increase height clearance 0.68 m (phase 3)

12) Markham Road, under Hwy. 401:

increase height clearance 0.10 m (phase 2)

or increase height clearance 0.50 m (phase 3).

13) St. Clair Avenue, under CNR Tracks at Caledonia Road.

increase height clearance 0.60 m (phase 2)

or increase height clearance 1.00 m (phase 3)

5.3.2 Step 2) Designate Interim Route Network

Having completed all modifications necessary to accommodate the Secondary Exceptional Load envelope on he recommended route, the Interim Network may be formally disignated. Following this step, the remaining modifications can be made to upgrade the Interim Network to the Final Network which will accommodate the Primary Exceptional Load Envelope.

The Interim Route Network is shown in Exhibit 5.6.

EXHIBIT 5.6: PROPOSED INTERIM ROUTE DESIGNATION FOR THE SECONDARY EXCEPTIONAL LOAD ENVELOPE, PHASE 2

5.4 PHASE 3: PROPOSED FINAL ROUTE NETWORK

5.4.1 Step 1) Undertake remaining modifications to make Secondary Exceptional Load Route into complete Primary Load Route.

In realizing the Secondary Envelope modifications, some constraints mentioned in Section 4.3.1 may have been completed. The remaining obstacles, those which only encroach upon the Primary Envelope, are listed below and shown in Exhibit 5.7.

1) Kipling Avenue, south of Horner Avenue:
   reconstruct underpass to accommodate Primary Envelope,
   review use of Islington Avenue as exceptional load route

2) Bathurst Street, underpass between Dupont Street and Davenport Road:
   reconstruct underpass to accommodate Primary Envelope

3) Steeles Avenue, under CNR tracks west of Leslie Street:
   increase height clearance 0.24 m

4) Lake Shore Boulevard, westbound to east end of Frederick G.Gardiner Expressway:
   widen on ramp right of way to 7.2 m

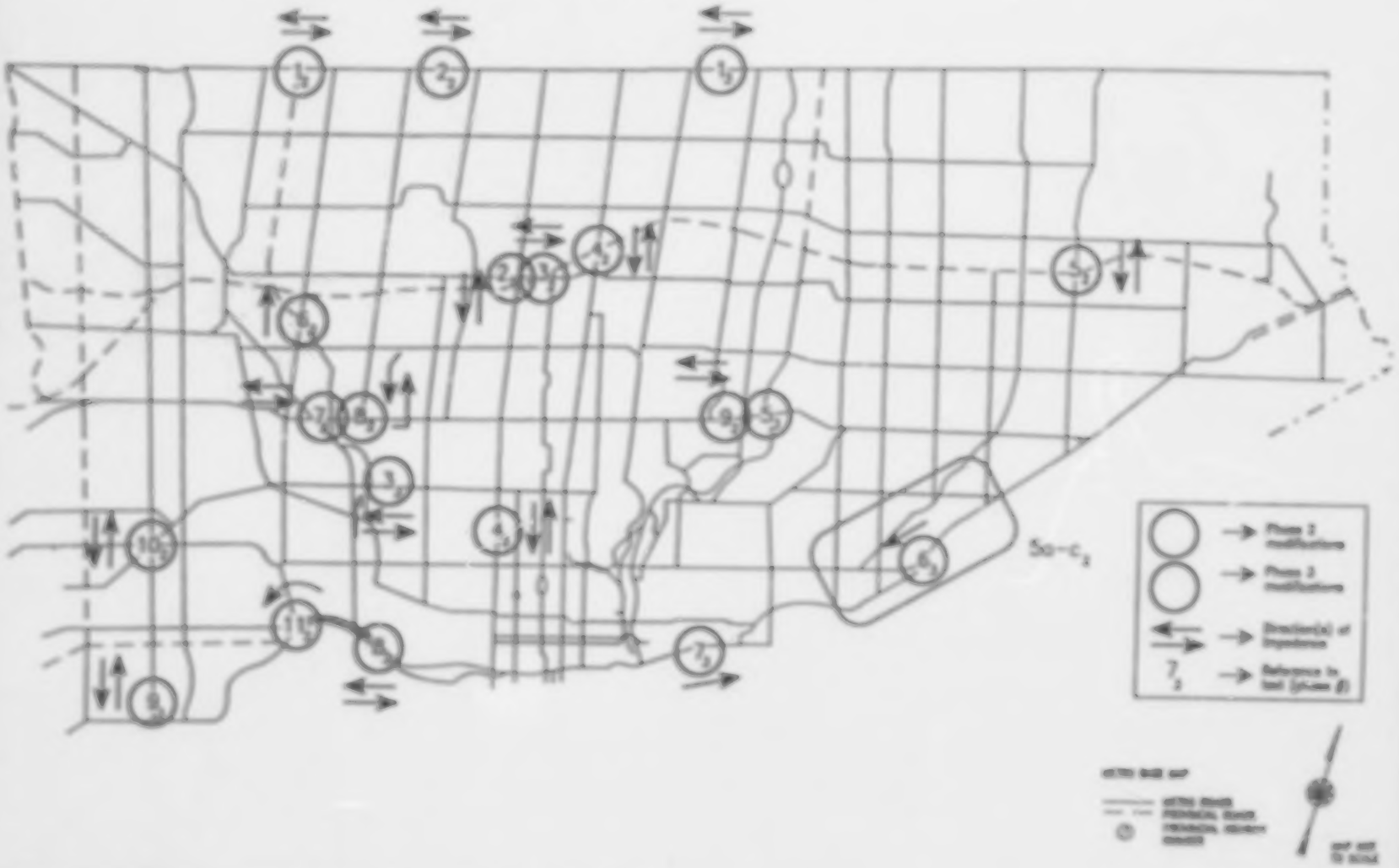
5) Kingston Road, westbound under Danforth Road:
   increase height clearance 0.27 m

6) Bathurst Street, under Hwy. 401:
   increase height clearance 0.20 m
   increase height clearance 0.30 m

7) Eglinton Avenue, under Don Valley Parkway:
   increase height clearance 0.12 m

8) Lake Shore Boulevard, pedestrian overpass at Jamieson Avenue:
   increase height clearance 0.20 m

EXHIBIT 5.7: PHASE 3 ROUTE MODIFICATIONS



5.4.2 Step 2) Designate Primary Exceptional Load Envelope

The following figures represent the proposed Primary exceptional load envelope and its corresponding design standards.

	Primary Envelope	Design Standards
Width	7.0 m	7.1 m (horizontal clearance)
Height	5.0 m	5.2 m (vertical clearance)
Length	30.5 m/36.6 m[10]	30.5 m/36.6 m[3]
Gross Weight	120.0 t[4]	120.0 t[11]

5.4.3 Step 3) Designate Primary Exceptional Load Route

Exhibit 5.8 illustrates the complete Final Network for the Primary Exceptional Load Envelope for Metropolitan Toronto.

5.5 SUMMARY

The phased plan outlined in Sections 5.2 - 5.4 allows for a great deal of flexibility in undertaking the necessary modifications. Where funds are available and construction/resurfacing etc. is imminent, heights or widths can be brought to primary size before Phase 3 is initiated, however, where funds are less, some modifications allow a route to be brought up to secondary standards until such a time when funds are available and the need warrants upgrading to primary levels.

The basis for this flexibility is not only monetary, other priorities do exist. Where a project is to be undertaken regardless of exceptional load activity, this study adds some criteria for its final design. Where a project is only in a working stage or for future consideration, this study may emphasize a further need for its initiation.

10 For vehicles with one and more than one articulation point, respectively.
11 Compliance with MTO guidelines #3.

EXHIBIT 5.8: PROPOSED FINAL NETWORK FOR THE PRIMARY EXCEPTIONAL LOAD ENVELOPE, PHASE 3

B – Route selection to be dependant upon Metro Government priorities.

A – To be reassessed after reconstruction of the Kipling Ave. underpass, south of Rainier Ave.

6.0 RELATED ISSUES

6.1 INTRODUCTION

Throughout the consultation process, a number of issues were raised repeatedly which did not directly involve route designation but were related to the Metropolitan Toronto area environment of exceptional load activity. Because of the prevalence of these issues, the number of times they have been raised and the emphasis placed upon them, they are presented for discussion in this section.

6.2 PERMITS

6.2.1 Permit Process

Most parties interviewed believed that the permit procedures including application, review and approval, could be more streamlined and have less points of agency contact. Such a system would allow for faster permit acquisition time for the carriers.

This appeared to be a major concern expressed by the carriers and their representatives, with particular reference to the time delays encountered with the City of Toronto permit process and its negative influence on the competitiveness of the Port of Toronto. A number of issues were raised on this topic and possible solutions tendered. However, in keeping with the original terms of reference, it is recommended that:

Metropolitan Toronto act quickly upon the primary objective of recommendation #12 from the Metropolitan Toronto Goods Movement Study which states.

"... that Metropolitan Toronto, in conjunction with the area municipalities, utility companies, and other agencies as appropriate, develop measures to improve the permit approval process."

6.2.2 Project Site Access

As noted in Section 2.4.1 of this report, a significant number of trips are destined for specific project sites, most recently Skydome and the Scotia Tower. Quite often, access to these sites involves traversing Area Municipal roadways, and therefore, including another set of agencies in the permit process. Because of the current system, carriers must reapply to all agencies for each trip regardless of previous approvals. It is therefore recommended that:

Metropolitan Toronto create a six month "Project Permit" which considers the following criteria:

a) **an initial route study to be undertaken for the maximum dimensions expected and for that study to remain valid for the project duration, up to six months;**

b) **both Metropolitan Toronto and Area Municipal roads be included in this temporary designation;**

c) **notification be made and conformation received, allowable by facsimile machine, for each individual trip to the project site, on the designated route, so that load specific conditions can be made;**

d) **any load surpassing the dimensions of the initial study be subject to the normal application and approval process, and;**

e) **this permit allowed to be extended beyond the six month period if conditions to the route remain unchanged or under renegotiated conditions.**

6.3 ROADWAY CONSIDERATION

6.3.1 Port of Toronto

The lands under the jurisdiction of the Toronto Harbour Commission as well as the major access routes to and from this area accou t for the majority of exceptional load trips in the Metropolitan Toronto region. Because any exceptional load trip destined for, or originating from, the Port must use a City of Toronto road, it is recommended that:

Metropolitan Toronto consider a joint project with the City of Toronto and the Toronto Harbour Commission to designate Port of Toronto roads for exceptional load traffic.

Specifically:

a) **to maintain and improve immediate access roads into the Port lands from Lake Shore Boulevard, which includes: Cherry Street, Don Roadway, Carlaw Avenue and Leslie Street;**

b) **to upgrade and permanently designate the above noted roads and Commissioners Street as exceptional load routes within the Primary Exceptional Load Envelope, and;**

c) **any proposal for development to the major access routes to the Port of Toronto be reviewed by the Metropolitan Toronto Transportation Department and relevant Area Municipal staff to ensure against any encroachment within the Primary Envelope.**

6.3.2 Use of Expressways

The issue was raised that the Don Valley Parkway and the Frederick G. Gardiner Expressway would provide more efficient access to the Port area by exceptional load trips. The suggestion was made that the innovations in vehicle design, such as multiple articulated vehicles and improved engine design, may allow for some exceptional load vehicles on these roads without

significant disruption of traffic flow. The carriers proposed that a strictly enforced and clearly defined set of conditions which allow, some vehicles to use them would greatly enhance trips to and from the harbour.

Likely disadvantages to such a system would involve:

- undue traffic delays because of traffic volumes seldom being low enough to accommodate the load;
- access at some of the interchanges being too difficult or impossible to negotiate with an exceptional load vehicle;
- access by emergency and maintenance vehicles responding to accidents involving exceptional load vehicles may be difficult, and;
- grades and ramp configurations on the Don Valley Parkway configurations may be too great to accommodate exceptional weight vehicles

Therefore, it is unlikely that any changes will be made regarding the use of Metropolitan Toronto area expressways for exceptional load traffic.

6.3.3 Trans-Border Movements

Another issue raised by many parties involved in the consultation process is the difference between the Provincial and Metropolitan Toronto policies concerning the times allowed for moving exceptional loads. Whereas Metropolitan Toronto requires most moves on Metropolitan Toronto roads to occur during nighttime hours, when traffic volumes are at their lowest, the Province of Ontario requires trips using Provincial highways to be taken during daylight hours, because of the increased visibility. In extenuating circumstances, MTO may grant permits for night moves if the section of road to be used is well lit.

As well, the neighbouring Regional Municipalities require moves to be made during daylight hours excluding rush hours. While the two positions seem to conflict, both are warranted in their justification i.e. Metropolitan Toronto moves its exceptional loads when congestion is lowest (12:00 a.m. - 6:00 a.m.) and the Regions allow moves when there is ample light for other drivers to see these loads.

Concern was raised that a carrier who did not follow an exact time schedule could be restricted at a Provincial highway or Regional border waiting for light or dark. This causes problems because the Metropolitan Toronto area roads are not generally built to accommodate an exceptional load vehicle resting on the shoulder. Therefore it is recommended that:

Metropolitan Toronto request the Province of Ontario to officially change their time of day policy to allow exceptional load vehicles to travel between 12:00 a.m. and 6:00 a.m. on Provincial roadways that are suitably lit. As well, Metropolitan Toronto to request the Province to extend the continuous highway lighting to suitable lay-by areas for exceptional loads. This should specifically include the weigh stations directly east and west of Toronto on Hwy. 401 and directly south on the QEW.

6.4 MONITORING

6.4.1 Awareness

The environment of exceptional load activity has received a low profile in Metropolitan Toronto with the public, politicians and other parties involved. Often, decisions affecting exceptional load traffic are not directly brought to the attention of the carriers and shippers. Conversely, innovations in vehicle design and the concerns of the various parties are not known to the implementors of exceptional load policy and procedure. In sum, communications between all parties involved is less than some would consider ideal. It is therefore recommended that:

Metropolitan Toronto initiate an Exceptional Load Issues Committee of government and industry representatives to meet 2 to 6 times yearly. The immediate objective is to reconcile existing concerns and to negotiate possible solutions. The long term aim is to maintain effective communications between parties to ensure that issues are discussed as they arise.

This committee may include representatives from:

1) Metropolitan Toronto Government;
2) Metropolitan Toronto Transportation Department;
3) Metropolitan Toronto Works Department
4) Metropolitan Toronto Planning Department
5) The Ontario Trucking Association;
6) Ministry of Transportation, Ontario;
7) Area Municipal Works Department;
8) The Toronto Harbour Commission, and;
9) Other experts who have an interest in exceptional load activity in the Metropolitan Toronto area.

6.4.2 Exceptional Load Activity Trends

Approached in different ways, the issue of Metropolitan Toronto's industrial zones entered into the consultations. Some were general in nature, such as infrastructure maintenance and development for established industrial zones, and some were specific as in questioning the future of the Port of Toronto lands.

One impetus for this report was the concern that routes for exceptional load vehicles are being closed down due to development. Many of these routes service industrial zones and the Port area. Heavy industrial zones and exceptional load routes are linked together and the closing of one will likely effect the other. Since a commitment has been made toward exceptional load activity by the authorization of this study, then an equal commitment should be made toward ensuring the future and needs of the industrial sector.

Therefore, it is recommended that:

Metropolitan Toronto develop a computerized database system containing pertinent exceptional load permit data. The type of information contained in this database would be:

a) **the separate dimensions of each load;**

b) **the route taken by the load (both Metro and Area Municipal roads), and;**

c) **the date and time of the trip.**

All information can be compiled, cross referenced and analyzed to access trends and provide statistics concerning exceptional load activity. Further, such a system could be made compatible with a computerized permit system providing information immediately to and from all relevant agencies in the permit process. This information linked with trends in the industrial sector, will ensure that exceptional load routes and industrial zones will be compatible and change with one another when necessary.

6.4.3 Inventories

Most realize that Metropolitan Toronto is a dynamic system of many variables which may change drastically in the short-term and long-term perspective. In regard to exceptional load traffic, these variables include: road design and upgrading, utility and services placement, construction and traffic congestion. In order that exceptional load traffic moves efficiently and effectively in the Metropolitan Toronto system it is recommended that:

a) **Metropolitan Toronto Public Works Department achieve a full inventory of utilities and services with reference to the Primary Exceptional Load Envelope within Metropolitan Toronto boundaries and that agreements be made with the utility companies to continuously upgrade the inventory;**

b) Metropolitan Toronto update all vertical and horizontal clearance inventories in regard to upgrading of existing roads and structures, and;

c) all inventories to be made accessible, along with short and long term construction projects, to Metropolitan Toronto and Area Municipal permits sections to aid in route selection of exceptional and special loads in Metropolitan Toronto.

Further, the Metropolitan Toronto and Area Municipal permit sections should have a confirmed link to both the proposed Metropolitan Toronto Situation Room and the MTO Traffic Control Centre.

This could be a physical link such as a dedicated telephone line or a policy link as in a written agreement. Since these are 24 hour traffic centres, a link among them would provide immediate route changes to provide carriers with the best available selection.

6.4.4 Future Metropolitan Toronto Road Projects

Many major road projects are underway and proposed for the Metropolitan Toronto area. Some of these include:

1) Taunton Road/Steeles Avenue connection,
2) Front Street extension,
3) Leslie Street extension,
4) Humber Bridge widening, and
5) Finch Avenue extension.

In light of the many projects being considered and undertaken by Metropolitan Toronto and the difficulty in providing completion dates due to environmental assessments, funds, etc., it was not possible to fully assess the effect these will have on exceptional load traffic.

Therefore, it is recommended that:

a) all projects currently initiated be reviewed by the Metropolitan Toronto Transportation Department upon their completion as to their exceptional load capability and possible effects on the proposed exceptional load route designation, and

b) all future projects be assessed as to their applicability to the proposed exceptional load route network and that their design standards adhere to the proposed Primary Exceptional Load Envelope.

7.0 SUMMARY OF RECOMMENDATIONS

7.1 INTRODUCTION

The recommendations found throughout Chapters 5 and 6 are listed below in the order that they appear in the text. Reference numbers have also been given for the sections where their relevant findings are and where the actual recommendation is written.

7.2 ROUTE DESIGNATION RECOMMENDATIONS

Based upon the investigations for this report several recommendations have been made for the Exceptional Load Route Designation.

PHASE I: CURRENT ROUTE DESIGNATION

This phase secures the network as it presently exists. This routing structure provides the foundation from which the final network will be made.

Step 1) Formally Designated Secondary Exceptional Load Envelope

From the input received and from investigations of Metropolitan Toronto Roads, a Secondary Exceptional Load Envelope has been developed.

Recommendation 1 (Sections 5.3.4, 5.2.1)

The Secondary Exceptional Load Envelope for:

Width	4.5 m
Height	4.6 m
Length	50.5 m
Gross Weight	100.0 t (MTO Guidelines #3)

Step 2) **Formal Designation of Current Network for the Secondary Exceptional Load Envelope**

At the present time many Metropolitan Toronto roads will accommodate most exceptional loads within the Secondary Envelope. This network, with the listed restrictions and in combination with recommendations 3 and 4, can be designated immediately.

Recommendation 2 (Sections 4.2, 5.2.2)

The Metropolitan Toronto roads indicated in Exhibit 5.10, along with noted restrictions, be designated as the Current Network for the Secondary Exceptional Load Envelope.

Step 3) **Prepare for Interim Network**

Since the Metropolitan Toronto road network cannot accommodate all exceptional loads and that some necessary diversions and integral modifications involve roads not under Metropolitan Toronto jurisdictions, Metropolitan Toronto must seek cooperation in the interim and long term to complete the networks.

Recommendation 3

Metropolitan Toronto initiate discussions with other bodies to achieve a complete network.

Specifically:

a) **with the Cities of Etobicoke, Scarborough and Toronto for interim designations of the area municipal roads shown in Exhibit 5.9 (Section 5.2.3);**

b) **with the Province of Ontario to negotiate solutions to obstructions in the Metropolitan Toronto road network that are under Provincial jurisdiction; and (Section 5.3.1)**

c) **with neighbouring Regional Municipalities to create new or upgrade existing lay-by areas on Metropolitan Toronto/Regional trans-border roads within the chosen network (Section 6.3.3).**

As mentioned earlier in this report the problems associated with assigning weight capacities has shown the need for further study.

Recommendation 4 (Sections 4.2.4, 5.2.4)

Metropolitan Toronto undertake a comprehensive review, as necessary, of bridge and road structures on the selected network.

The following information should be compiled for each structure, but the review not be limited to:

a) **the statistical frequency of expected exceptional weight vehicles on the selected network;**

b) **the distribution of size and types of loads expected;**

c) **the effect of a) and b) on the expected life span and structural integrity of the bridge or road; and**

d) **given the information obtained above and the priorities assigned to the bridge or road, a decision be made as to the limit criteria for exceptional weight vehicles on these structures.**

Until this review is completed, all exceptional weight applications must be subjected to the current permit review process.

PHASE 2: PROPOSED INTERIM ROUTE NETWORK

Step 1) **Expand Current Network to Accommodate Secondary Envelope.**

Having a formally designated network in place, steps can be taken to upgrade this network to accommodate exceptional loads within the Secondary Envelope on all Metropolitan Toronto roads.

Recommendation 5 (Section 5.3.1)

Metropolitan Toronto undertake the modifications necessary to accommodate the Secondary Exceptional Load Envelope on the selected Metropolitan Toronto road network. Where convenient, undertake modifications recommended in Phase 3: Final Network.

The locations of the Phase 2 modifications are shown in Exhibit 5.11

Step 2) **Formally Designate the Interim route Designation For the Secondary Exceptional Load Envelope.**

The roads comprising this network can be seen in Exhibit 5.12

PHASE 3: PROPOSED FINAL ROUTE NETWORK

At the beginning of this phase, a complete network capable of accommodating the Secondary Exceptional Load Envelope will be complete. As well, some modifications may have been made to upgrade the Interim Network to accommodate thee Primary Exceptional Load Network.

Step 1) **Complete Final Network**

Recommendation 6 (Section 5.4.1)

Metropolitan Toronto undertake the remaining modifications necessary to upgrade the interim network to accommodate the complete Primary Exceptional Load Envelope.

Step 2) **Upon Completion of Recommendation 6:**

Recommendation 7

Metropolitan Toronto formally designate and protect the final network as the Primary Exceptional Load Network as shown in Exhibit 5.14.

Step 3) **After review of all modifications and the completed network:**

Recommendation 8 (Section 5.4.2)

Metropolitan Toronto formally designate the Primary Exceptional Load Envelope. The dimensions of this envelope to be:

Width	**7.0 m**
Height	**5.0 m**
Length[12]	**30.5 m/36.5 m**
Gross Weight[13]	**120.0 t**

1) for vehicles with one, and more than one articulation points, respectively
2) compliance with MTO Guidelines #3.

12 For vehicles with one and more than one articulation point, respectively
13 Gross weight, compliance with MTO guidelines #3

This phased plan allows for flexibility in time and priorities. While no times have been assigned to this plan, some steps must be run consecutively, such as completing modifications prior to designating the envelope. Other components, such as the modifications in Phase 2 and 3, may be run concurrently adding to the overall flexibility.

7.3 RECOMMENDATIONS OF RELATED ISSUES

1) Permit Process

Prevalent in the consultations for this study was concern over the permit process in Metropolitan Toronto and the Area Municipalities. The concern most often stated was time delays caused by an extensive review process.

Recommendation 9 (Section 6.2.1)

Metropolitan Toronto act quickly upon the primary objective of Recommendation 12 from the Metropolitan Toronto Goods Movement Study which states:

"....that Metropolitan Toronto, in conjunction with the area municipalities, utility companies, and other agencies as appropriate, develop measures to improve the permit approval process."

Project Site Access

As noted previously in this report, a significant number of exceptional load trips, are destined for specific project sites. Access to these sites often requires the carrier to use area municipal roads and therefore necessitating the involvement of a further set of municipal agencies.

Recommendation 10 (Section 6.2.2)

Metropolitan Toronto create a six month "Project Permit" which considers the following criteria:

a) **an initial route study be undertaken for the maximum dimensions expected for exceptional loads to the site and for that study to remain valid for the project duration, up to six months;**

b) **both Metropolitan Toronto and Area Municipal roads to be included in this temporary designation;**

c) **notification be made and confirmation received, allowable by facsimile machine, for each individual trip to the project site, on the designated route, so that load specific conditions can be made;**

d) **any load surpassing the dimensions of the initial study be subject to the normal application and approval process; and**

e) **this permit be extendable beyond the six month period if conditions to the route remain unchanged of under renegotiated conditions.**

2) **Port of Toronto**

The Port of Toronto is the origin and destination for more exceptional load trips than any other single area in Metropolitan Toronto. Because of its location on area municipal roads, the carrier of an exceptional load may have to deal with up to three separate governmental bodies to obtain passage: the City of Toronto, Metropolitan Toronto, and either the Province of Ontario or another municipal body. With many points of contact, the carriers face frustrating time delays.

Recommendation 11 (Section 6.3.1)

Metropolitan Toronto consider a joint project with the City of Toronto and the Toronto Harbour Commission to designate Port of Toronto roads for exceptional load traffic.

Specifically:

a) **to maintain and improve immediate Access roads into the Port lands from Lake Shore Boulevard, which includes: Cherry Street, Don Roadway, Carlaw Avenue and Leslie Street;**

b) **to upgrade and permanently designate the above noted roads and Commissioners Street as exceptional load routes within the Primary Exceptional Load Envelope; and**

c) **Any proposal for development to the major access routes to the Port of Toronto be reviewed by Metropolitan Toronto Transportation Department and relevant Area Municipal staff to ensure against any encroachment within the Primary Envelope.**

3) **Trans-Border Movement**

The problem of conflicting movement times between regions has been dealt with in Recommendation 3, however, the same problem exists at the junction of Metropolitan Toronto roads and Provincial highways.

Recommendations 12 (Section 6.3.3)

Metropolitan Toronto request the Province of Ontario to officially change their time of day policy to allow exceptional load vehicles to travel between 12:00 am and 6:00 am on Provincial roadways that are suitably lit. As well, Metropolitan Toronto to request the Province to extend the continuous highway lighting to suitable lay-by areas for exceptional loads. This should specifically include the weight stations directly east and west of Toronto on Hwy. 401 and directly south on the QEW.

4) **Awareness**

The environment of exceptional load activity has received a low profile among the public, politicians and other parties in Metropolitan Toronto. Communications between key players, especially thee carriers and municipal governments has been less than some would consider ideal.

Recommendation 13 (Section 6.4.1)

Metropolitan Toronto initiate an Exceptional Load Issues Committee to meet 2 to 6 times yearly, as necessary. The immediate objective is to reconcile existing concerns and to negotiate possible solutions. The long term aim is to maintain effective communications between parties to ensure that issues are discussed as they arise.

This committee may include some or all of the following representative from:

1) Metropolitan Toronto Government;
2) Metropolitan Toronto Transportation Department;
3) Metropolitan Toronto Public Works Department;
4) Metropolitan Toronto Planning Department;
5) The Ontario Trucking Association;
6) Ministry of Transportation Ontario;
7) Area Municipal Public Works Departments;
8) The Toronto Harbour Commission; and
9) Other experts who have an interest in exceptional load activity in Metropolitan Toronto.

Exceptional Load Activity Trends

As long as exceptional load trips have occurred in Metropolitan Toronto few municipal departments or private agencies have monitored the exceptional load activity in Metropolitan Toronto. This coupled with the lack of communication listed above has produced and environment of decreasing route opportunities and the threat of route closure, by developments which do not realize the extent of activity in the area.

Recommendation 14 (Section 6.4.2)

Metropolitan Toronto develop a computerized database system containing pertinent exceptional load permit data. The type of information contained in this database would be:

a) **the separate dimensions of each load;**
b) **the route taken by the load (both Metropolitan Toronto and Area Municipal roads); and**
c) **the date and time of the trip.**

All information can be compiled, cross referenced and analyzed to access trends and provide statistics concerning exceptional load activity. Further, such a system could be made compatible with a computerized permit system providing information immediately to and from all relevant agencies in the permit process.

6) Inventories

Due to the dynamics of utility companies and municipal agencies continuously working within exceptional load envelopes, temporary and permanent obstructions may be in place before the carrier or the permit issuers are aware.

Recommendation 15 (Section 6.4.2)

a) **Metropolitan Toronto Public Works Dept. achieve a full inventory of utilities and services with reference to the Primary Exceptional Load Envelope within Metropolitan Toronto boundaries and that agreements be made with the utility companies to continuously upgrade the inventory;**

b) **Metropolitan Toronto update all vertical and horizontal clearance inventories in regard to upgrading of existing roads and structures, and;**

c) **all inventories to be made accessible, along with short and long term construction projects, to Metropolitan Toronto and Area Municipalities permit sections to aid in route selection of exceptional and special loads in Metropolitan Toronto.**

7) Future Projects

As well, many major road projects are currently in progress or proposed for development. Because of the uncertainty in completion dates and lack of time for investigation, the current projects could not be assessed for their potential impact on exceptional load traffic.

a) **all projects currently initiated be reviewed by the Metropolitan Toronto Transportation Department upon their completion as to their exceptional load capability and possible effects on the proposed exceptional load route designation, and**

b) **all future projects be assessed as to their applicability to the proposed exceptional load route network and that their design standards adhere to the proposed primary load envelope.**